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A CONSIDERATION OF THE STONELESS GALLBLADDER

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Several writers have called attention to the frequency of unsatisfactory results after cholecystectomy on patients whose gallbladders showed a minimal amount of change from the normal condition (Whipple,[1] Muller,[2] Judd,[3] Stanton [4] and others). The observation, therefore, that surgical results in the stoneless gallbladder, on the whole, are not so satisfactory as in those cases in which gallstones are present is not by any means new.

In most other conditions the idea has gained ground that one should attack a disease early in order to obtain the most satisfactory therapeutic results. Alvarez [5] has even suggested that the same principle holds true in cases of cholecystitis. There is some reason to think, however, that this principle does not hold for diseases of the biliary tract. Indeed, if one were to be guided only by a table of comparative results obtained by cholecystectomy in cases of minimal pathologic change as compared with those which showed marked and definite changes, one might jump to the conclusion that the statistical results proved the point that cholecystectomy should not be undertaken in the early cases of cholecystitis before well marked changes have occurred.

The case, however, is not so simple and it cannot well be decided merely on the evidence of a compilation of statistics. There are several other considerations that must be taken into account. For example, in assessing the proper value to be placed on the operation of cholecystectomy for the relief of symptoms, it is necessary to take several other considerations into account. Obviously the first question to be asked before an operation is performed in a given case is How much does the gallbladder contribute to the symptoms of that particular patient? It is clear that when the patient is suffering from repeated attacks of severe biliary colic with its associated symptoms the relief of the symptoms occasioned by the removal of the offending agent may be very striking. An example of such a case is one in which a stone is lodged in the cystic duct or in the neck of the gallbladder. On the other hand, if the patient is having only comparatively mild symptoms, regardless of the extent of the pathologic changes that may be present in the gallbladder, the relief of symptoms obtained by cholecystectomy will be proportionately less. Moreover, if the patient happens to have another unrelated lesion that is responsible for many of the symptoms, it is obvious that the removal of the gallbladder will not give satisfactory relief despite the existence of well marked disease in the latter organ. An example of the latter sort in our experience was a patient who had calculi in the gallbladder but also an early tuberculosis of the spine which became progressive. Finally also there are the patients whose symptoms come chiefly if not entirely from lesions that are mistaken for diseased gallbladders, in whom the operation of cholecystectomy fails to give the expected relief. It is perhaps not sufficiently appreciated that many common conditions are often confused with gallbladder disease, particularly with the less severe forms of cholecystitis, and that operations are therefore unwisely performed on the biliary tract with necessarily a large percentage of failures to relieve the patient of symptoms. Some of the most common of these conditions are diseases of the spine, especially osteo-arthritis, chronic constipation, surgical diseases of the right kidney and urinary tract, and duodenal ulcer.

When a decision has finally been reached to perform an operation on the biliary tract in a patient with comparatively mild symptoms of cholecystitis, the surgeon, if he finds little evidence of a pathologic change at the operation, is likely to try to find solace and justification for the removal of the gallbladder in the microscopic examination of the organ. Unfortunately, however, this examination is unlikely to be of much help in just those cases in which the help may be most needed. It is well known, for example, that there is practically no agreement among pathologists as to what constitutes a normal gallbladder. This is especially true after middle life, the period in which most patients present themselves for operation for the condition. It is rare, therefore, for a gallbladder to be pronounced normal on the basis of a microscopic examination.

With these considerations, it should not seem strange that statistics in general have shown that the best results have followed those operations which have been performed in cases not of early or minimal pathologic changes but rather in those associated with relatively advanced changes. The presence of calculi usually

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1. Whipple, A. O., cited by Muller.[2]
2. Muller, G. P.: The Noncalculous Gallbladder, J. A. M. A. **89**: 786 (Sept. 3) 1927.
3. Judd, E. S.: Clinical Versus Pathological Cholecystitis, Collected Papers of the Mayo Clinic **17**: 152, 1925.
4. Stanton, E. M.: Stoneless Gallbladder: Study of Operative Cases, Am. J. Surg. **18**: 246 (Nov.) 1932.
5. Alvarez, W. C.; Meyer, K. F.; Rusk, G. Y.; Taylor, F. B., and Easton, Jessie: Present-Day Problems in Regard to Gallbladder Infections, J. A. M. A. **81**: 974 (Sept. 22) 1923.

implies a condition of relatively advanced pathologic change. Regardless of the exact origin of stones in the biliary tract, their presence necessarily implies a more advanced state of the process that caused them than the beginning of the process, and under no circumstances can they be regarded as a normal finding, no matter whether their origin was an infection or merely a disturbed state of metabolism. Moreover, it can scarcely be denied that the stones themselves often produce severe symptoms by blocking the ducts or by acting like foreign bodies in maintaining an infection. On the other hand, in the cases of most advanced pathologic changes the results are not likely to be so good because in such cases serious and usually irreparable damage has usually occurred in other important organs, notably the liver and pancreas. Again also the question of overlooked stones in the ducts arises. However, it should not be understood that a satisfactory relief from symptoms is never to be expected in a patient with minimal changes; for, as the analysis to be given will show, even in such cases a satisfactory result may be obtained in the majority of instances provided reasonable care has been exercised to exclude other sources of the patient's complaints.

I should like, therefore, to review certain features based on a study of 161 patients who were operated on at the Barnes Hospital but who had no stones, except in the cases of seventeen who had a combination of cholesterosis with stone. The latter cases were added because by some the conditions of cholesterosis and of cholesterol stones are considered to be expressions of a disturbed metabolism rather than of a definite disease of the gallbladder. All the patients who comprised this study had had a cholecystectomy more than a year before they were reexamined to determine the results.

The 161 patients whose condition was ascertained more than a year after operation were classified, according to pathologic lesions, as follows: minimal lesion, fifty-seven; cholesterosis without stone, thirty-one; chronic catarrhal cholecystitis, fifty-one; chronic fibrous cholecystitis, five; cholesterosis with stone, seventeen.

The term minimal lesion was assigned to those cases in which the gallbladder wall was not greatly thickened, the organ contained concentrated bile, and on microscopic examination there were a few lymphocytes in the wall. A diagnosis of cholesterosis was made when the mucosa of the gallbladder contained the yellowish plaques that are characteristic of lipoid deposits. Chronic catarrhal cholecystitis was said to be present when there was edema of the mucosa, a greater infiltration of lymphocytes than in the minimal lesion and some muscular thickening. Chronic fibrous cholecystitis was the term applied to those gallbladders with markedly thickened walls, cuboidal epithelium that often is absent in places, and diverticular crypts. This type of lesion is almost always accompanied by biliary calculi.

The ultimate results in those cases in which no stones were present showed only 60 per cent of patients who considered themselves well. There was an equal number of gallbladders which had a few adhesions and of those which had many adhesions. In the class listed as greatly improved nearly three times as many patients showed only a few adhesions around the gallbladder. On the other hand, all of the seventeen patients with cholesterosis and stone showed either marked improvement or complete recovery from their symptoms.

Of perhaps greater importance and of greater interest is the fact that in 153 cases of this series it was possible to compare the results in those patients who gave a definite history of biliary colic with those who did not have such a history. Of the stoneless cases only 33 per cent gave a history of biliary colic, but 76 per cent of these patients considered themselves well or improved. On the other hand, only 58 per cent of those without biliary colic were well or improved. Moreover, 82 per cent of the patients with cholesterosis and stone gave a history of biliary colic and all were relieved. Again, although the remaining 18 per cent of the cases of cholesterosis with stone did not give a history of biliary colic, nevertheless they were all improved. The importance of stones in the production of symptoms is therefore again emphasized.

In an attempt to correlate the importance of the pathologic changes to the prognosis after cholecystectomy, table 1 was arranged.

TABLE 1.—*Importance of Pathologic Changes to Prognosis After Cholecystectomy*

	Well	Improved	Unimproved	Postoperative Death	Total
Minimal lesion	11	22	21	3	57
Cholesterosis	14	2	14	1	31
Chronic catarrhal cholecystitis	18	16	13	4	51
Chronic fibrous cholecystitis	2	3	0	0	5
Cholesterosis with stone	6	11	0	0	17
	51, or 31.7%	54, or 33.5%			161

Table 1 illustrates two points in a striking manner. One is that, although only a small proportion of the patients were relieved of all their complaints, nevertheless about 65 per cent considered themselves improved. This point indicates that there is no justification for an undue pessimism concerning the results of operation on the stoneless gallbladder, despite the fact that the results are far from satisfactory. In this particular group of cases the postoperative mortality was excessively high; in fact, far higher than in our total series of cholecystectomy performed for conditions with and without stones. For the last five years our total operative mortality for cholecystectomy has ranged around 1 per cent. For a period of two years the mortality stayed at only 0.4 per cent. All patients who died in the hospital after operation are considered as postoperative deaths. Actually, however, in the majority of instances the operation probably had little or nothing to do with causing the death. The fact that the mortality is so high in the stoneless cases is found to be due on closer analysis largely to faulty diagnosis; that is to say, many of these deaths were due to general constitutional disorders of which the suspected gallbladder disease proved to be only an insignificant detail. Included in the category of constitutional disorders was one case of a blood stream infection and several other cases of primary hepatic disease. Most of the patients who died probably should not have been subjected to operation at all. This consideration is a matter of great importance because not only does it emphasize the necessity of a complete inventory of the patient who happens to have some evidence of gallbladder disease, but it also indicates that, as a rule, a primary hepatic disease (cirrhosis, toxic hepatitis, and the like) is not favorably influenced by cholecystectomy even when the gallbladder presents definite pathologic changes. Our rule now is usually not to operate on a patient's gallbladder merely

because he presents some evidence of cholecystic disease unless, after a thorough and complete examination, we can satisfy ourselves that probably the symptoms are coming from that organ, at least to a major degree.

Another angle from which this study has been made has been to attempt to correlate the cholecystographic examinations with the ultimate results in cases of the stoneless gallbladder. Of the 161 cases that have been made the basis of this whole study, for various reasons only 114 are available for a particular investigation of the correlation of the cholecystographic response with the ultimate postoperative results. These are presented in table 2.

TABLE 2.—*Cholecystogram and Prognosis: 114 Cases*

Type of Cholecystographic Response	Total	Clinical Result				Percentage Well or Improved
		Well	Improved	Unimproved	Postoperative Death	
Normal gallbladder..	10	5	1	4	0	60
Deformed shadow...	8	4	2	2	0	75
Faint shadow.....	75	22	22	28	3	59
No shadow.....	21	6	7	5	3	62
	114	37	32	39	6	60

Certain rather astonishing results have been obtained from this particular study. It will be seen, for example, that the total percentage of well or improved patients, which is 60, is about the same as the percentage that showed a faint shadow or a shadow which was designated as being normal. Some discussion is needed to clarify these points. The ten patients who were operated on in spite of a normal cholecystographic response had their operations because it was felt that the symptoms warranted the operation in spite of the negative roentgen examinations. The series of ten cases of this sort is, of course, far too small from which to draw any sweeping conclusions. Moreover, since six of these patients considered themselves either well or improved after operation, our own inclination is to assume that probably the removal of the gallbladder had little or nothing to do with the relief of the symptoms. Our routine procedure is to remove the appendix also whenever a cholecystectomy is performed. It is within the range of possibility, therefore, that the removal of a diseased appendix was perhaps more responsible for the relief of symptoms in these cases than the removal of a normal gallbladder.

Previous studies have shown that at our hands a gallbladder that appears normal on cholecystographic examination rarely shows any pathologic changes other than those which we have described as minimal in this article. The question of faintness of shadow is an old stumbling block. From the beginning of our experiments with cholecystography as well as those of others it has been recognized that faintness of shadow constitutes a great difficulty in diagnosis of cholecystic disease. The fact that only 62 per cent of those patients who had no shadow were relieved of their symptoms by cholecystectomy may occasion some astonishment because ordinarily others as well as ourselves have interpreted the failure of a shadow as a definite indication of demonstrable disease of the gallbladder in practically all instances, provided the technic has been satisfactorily performed. The fact that in this series only 62 per cent of such patients were relieved of their symptoms after cholecystectomy in our opinion merely indicates again the frequency with which the chief symptoms of which a patient complains are ascribed to the gallbladder merely because that shows some evidence of disease. It is not a reflection on the value of cholecystography as a means of demonstrating a disturbed function of the gallbladder but rather it constitutes a reflection of our failure to assess properly the different complaints of the patient. In other words this finding reemphasizes the necessity of a complete and thorough search in other parts of the body for the causes of symptoms that may be thought to be due to the gallbladder, especially when those symptoms are not severe.

SUMMARY

This study emphasizes the point that from the standpoint of satisfactory results the symptom of pain, particularly the typical biliary colic, is an important feature. In the absence of severe pain the beneficial results to be obtained by cholecystectomy in cases of a stoneless gallbladder are likely to be unsatisfactory in approximately 40 per cent. There seems at present to be little justification for the subjection to operation of patients who have only the early beginnings of cholecystic disease, unless one is interested in the prevention of complications. At any rate, the evidence indicates that if one operates on such patients the results will be far from satisfactory in almost one half of the cases. In this article no particular mention has been made of other features of cholecystic disease, such as flatulent dyspepsia. It will be apparent, however, from the remarks already made that symptoms other than pain which are commonly associated with gallbladder disease are much less likely to disappear after cholecystectomy than is pain itself, unless the changes in the organ are definite and marked. The determination of how much a patient's symptoms are due to the gallbladder in a case of minimal disease of that organ is extremely difficult. Many of these patients are undoubtedly on the borderline between purely functional and anatomic disorders that produce disturbances of function. In order to arrive at a satisfactory incrimination of the gallbladder it is necessary to examine the patient thoroughly with reference to the possibility of other sources of the complaints; and so far as the gallbladder itself is concerned it is necessary not only to take a very careful clinical history but also to resort to various special methods of examination. Even after the presence of cholecystic disease is demonstrated in the anatomic sense, however, it is still difficult to satisfy oneself that the function of the organ is sufficiently disturbed by those pathologic changes to cause the symptoms of which the patient complains. The presence of calculi and the history of typical biliary colic greatly increase the chance of a satisfactory result after cholecystectomy.

Introduction of Lumbar Puncture.—In the year 1891, and in a quiet way, came an experiment which slowly led to the most astounding progress in our knowledge of nervous disease and of its diagnosis, differentiation and treatment. No event in the history of neurology has brought so many assets as has the introduction of lumbar puncture. Quincke of Magdeburg conceived that he might relieve the symptoms of hydrocephalus by draining the cerebrospinal fluid. Six years previously Corning in America had drained the fluid for the treatment of tuberculous meningitis, but Quincke was the first to make his work known throughout the world. The discovery of changes indicative or characteristic of certain diseases in this hitherto unimportant fluid soon followed, and lumbar puncture has become a routine in diagnosis and treatment.—Collier, James: The Harveian Oration on "Inventions and the Outlook in Neurology," *Brit. M. J.* **2**:707 (Oct. 20) 1934.

THE APPLIED PHYSIOLOGY OF THE EXTRAHEPATIC BILIARY TRACT

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Since an epoch in the advance of knowledge of the physiology and functional pathology of the biliary tract has been witnessed during the past decade, it is appropriate to outline the present state of information concerning it.

The gallbladder manifests, like the intestine, three types of activity: absorption, secretion and motor activity.[1]

ABSORPTION OR CONCENTRATION

In the process of absorption, the gallbladder concentrates the hepatic bile that enters it from four to ten times. Chiefly water and certain inorganic constituents are absorbed. In the process of absorption the bile, which is alkaline as it leaves the liver, is slightly acidified. The bile acids render the fats and cholesterol soluble at the acid reaction of gallbladder bile.

The concentrating function of the gallbladder renders it a reservoir of small volume but large capacity. In the fasting human being or dog it may store the entire twelve or twenty-four hour output of hepatic bile. This is the reason why dogs without a gallbladder become jaundiced sooner after complete common duct obstruction than dogs with a gallbladder.[2]

The bile ducts of animals possessing a gallbladder do not concentrate to a significant extent.[3] The bile in the obstructed duct, in the absence of the gallbladder, may look considerably darker than hepatic bile for the first day or so, but this is said to be due to a change of bilirubin to biliverdin.[3a] If there is any concentration of bile in the obstructed common duct in the absence of the gallbladder, it does not amount to more than two or three times.[3b]

The acutely inflamed gallbladder mucosa does not concentrate. If the inflammation of the mucosa is "patchy" or if the inflammation is localized to the serosa or muscularis, the gallbladder may concentrate. The acutely inflamed gallbladder does not evacuate. After the acute inflammation has subsided, the gallbladder may again concentrate and evacuate. However, if fibrosis results, concentration does not occur, or is slight.[4]

Caylor and Bollman[5] found that the gallbladder which has hypertrophic rugae with papillomas concentrates exceedingly well. We[6] can verify this for dogs. Such gallbladders, of course, visualize well, until inflammation occurs. Hyperplasia of the rugae and lymphoid tissue of the gallbladder may be produced in the dog by biliary stasis[6] caused by stricture of the common duct or reversed loops of the duodenum. Thus, a hypertonic sphincter of Oddi or abnormal duodenal motility may cause stasis and hypertrophy of the gallbladder mucosa.

Cholesterosis of the gallbladder ("strawberry gallbladder") is a condition characterized by lipoid deposits in the mucosa of the organ. Its pathogenesis is not well understood, but a similar condition has been obtained experimentally in rabbits by producing low grade inflammatory changes in the gallbladder wall and at the same time feeding cholesterol. Cholesterosis does not interfere with the concentrating activity or emptying of the gallbladder unless associated with a moderate or severe cholecystitis.[7]

SECRETION

The gallbladder secretes normally a mucoid fluid. The normal rate is not known, but in human cases of cystic duct obstruction with a gallbladder fistula, 20 cc. for each twenty-four hours has been collected.[8] When the gallbladder is acutely inflamed, a considerable quantity of limpid, sometimes blood-tinged, fluid is formed by the mucosa.[9]

The ducts secrete a colorless slightly viscous substance, particularly when obstructed.

When the common duct is obstructed for twelve or fourteen days with a normal gallbladder in place, green fluid, or a "green system," is found in the ducts. When the common duct is obstructed for twelve or fourteen days with the gallbladder out or functionless, a white fluid, or a "white" system, is found. This is the "white bile" that the surgeon finds not infrequently.[3a]

"White bile" or lightly pigmented bile is found and can be produced experimentally under the following conditions: (*a*) common duct obstruction with a functionless gallbladder; (*b*) when liver secretes against pressure in the absence of total obstruction; (*c*) toxic hepatitis (chloroform, and the like); (*d*) high grade ascending infections or hematogenic hepatitis. In infectious febrile diseases such as pneumonia, bile output is decreased, but a "white bile" is not secreted unless there is an associated hepatitis.

The "white bile" of the gravest concern to surgeons is associated with toxic or a generalized hepatitis. Here one must treat the hepatitis, whether due to obstruction or other causes. If the surgeon finds no obstruction, the patient should not have been operated on; but the differential diagnosis is not always easy. There is, of course, a high grade dye retention and icterus in all "white bile" cases.

Clinical experience indicates that dextrose may be used effectively in these cases. Dextrose favors the activity of liver cells and also the reduction of coagulation time of the blood.[10] Calcium chloride is also used by some clinicians, particularly in the presence of a hemorrhagic tendency. The evidence indicates that even in the bleeding cases calcium affects some tissue, probably the liver, other than the blood.[11] Bile salts should probably not be used to start a flow of pigmented bile,

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A consideration of cholelithiasis and reflex symptomatology is intentionally omitted from this discussion.

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2. Afanassiew: Ztschr. f. klin. Med. **6**: 281, 1883. Mann, F. C., and Bollman, J. L.: J. Lab. & Clin. Med. **10**: 540 (April) 1925.
3. (*a*) Rous, Peyton, and McMaster, P. D.: J. Exper. Med. **34**: 75 (July) 1921. (*b*) Brugsch, T., and Horsters, H.: Arch. f. exper. Path. u. Pharmakol. **118**: 292, 1926. (*c*) Judd, E. S., cited by Cox, F. W.: Surg., Gynec. & Obst. **55**: 168 (Aug.) 1932. (*d*) Burden, V. G.: Ann. Surg. **82**: 584 (Oct.) 1925.
4. Ivy, footnote 1, pp. 15 and 54.
5. Caylor, H. D., and Bollman, J. L.: Bilirubin Content of Gallbladder Bile in Cholecystic Disease, Arch. Path. **3**: 993 (June) 1927.
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7. Illingworth, C. F. W.: Brit. J. Surg. **17**: 203 (Oct.) 1929.
8. Birch and Spong: J. Physiol. **8**: 378, 1887.
9. Riegel, Cecilia; Ravdin, I. S., and Johnston, C. G.: Am. J. Physiol. **99**: 656 (Feb.) 1932.
10. Althausen, T. L.: Dextrose Therapy in Diseases of the Liver, J. A. M. A. **100**: 1163 (April 15) 1933. Ravdin, I. S.: Some Aspects of Carbohydrate Metabolism in Hepatic Disease, J. A. M. A. **93**: 1193 (Oct. 19) 1929.
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since, according to Adlersberg,[12] dehydrocholic acid decreases the rate of elimination of bilirubin and dyes from the blood into the bile.

MOTOR ACTIVITY OF GALLBLADDER

The motor activity of the gallbladder is of two types: first, rhythmic tonus changes amounting to from 1 to 3 cm. of bile pressure, which may be augmented in rate and amplitude by any mild adequate stimulation, and, second, a tonic contraction of the musculature of the gallbladder as a whole. The gallbladder of the dog by contracting may exert a pressure of from 20 to 30 cm. of bile.[1] The force of contraction of the human gallbladder has not been measured, but it has been seen by direct vision to contract and evacuate.[1] It is interesting that stones located in a group in the fundus of the gallbladder may line up in a column of twos after the ingestion of a fatty meal.[13]

It is obviously significant that the power of the normal gallbladder to contract is not greater than the secretory pressure of bile.

The chief stimulus of gallbladder contraction thus far discovered is the hormone cholecystokinin. The stimulation of nerves has never been observed to have more than a slight and temporary effect on gallbladder evacuation.[1]

The hormone may be extracted from the duodenal mucosa and, when injected intravenously, causes a more or less prolonged contraction of the gallbladder with evacuation. It has been demonstrated to operate physiologically by cross-circulation and transplantation experiments in the dog and by blood transfusion experiments in man.[1]

The most effective excitants of hormone production are acids and fats acting in the upper part of the intestine. All fats are effective, but egg yolk and cream appear to be the most active. Proteins, particularly meat, rank next, and carbohydrates have no action.

The action of many drugs on the musculature of the gallbladder has been studied. In our hands, cholecystokinin has proved to be the most powerful gallbladder motor excitant known and produces no side actions such as a fall or rise in blood pressure.

Atropine relaxes the gallbladder but does not abolish the action of cholecystokinin. Morphine, when effective, increases the tonus rhythm of the gallbladder. Pilocarpine may cause some expulsion of bile from the gallbladder into the ducts, but it does not cause evacuation, owing to its augmentation of sphincteric and duodenal tone. Solution of pituitary after a latent period of ten or fifteen minutes causes the gallbladder to contract and frequently to evacuate from one fourth to one half of its contents. However, solution of pituitary is not as effective as egg yolk and fat.[1]

Surgical operations such as gastro-enterostomy, gastric resection, and pyloroplasty do not decrease the efficacy of egg yolk in provoking gallbladder evacuation.[14] However, the injection of egg yolk into the mid or lower part of the ileum has no effect on the gallbladder.[1] During the first day or two following operations on the upper part of the abdomen the gallbladder may manifest a rather marked atonic distention.[14]

12. Adlersberg, David: Gallensekretion und Gallenentleerung, Vienna, Franz Deuticke, 1929.
13. Kalk, H., and Schöndube, W.: Ztschr. f. ges. exper. Med. **53**: 461, 1926. Dufour, P.: J. de radiol. et d'électrol. **15**: 300 (June) 1931.
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SPHINCTER OF ODDI

Whether or not the gallbladder will evacuate when stimulated depends on the tone of the sphincter of Oddi or duodenum, or the intramural resistance offered to the flow of bile from the common duct into the lumen of the duodenum. (We shall hereafter designate the intramural resistance as being due solely to the sphincter of Oddi, which is true only in part.)

The sphincter of Oddi can resist up to 75 cm. of bile pressure, whereas the maximum expulsive pressure of the normal gallbladder is 30 cm. Hence it is possible for a spastic sphincter or duodenum to prevent gallbladder evacuation.

In human subjects it has been shown that, if the sphincter is spastic, biliary colic may be produced by exciting the gallbladder to contract. Magnesium sulphate introduced into the duodenum will relieve the pain, and dark bile will be obtained.[15] This condition has been called "hypertonic dyskinesia" by Westphal,[16] "cholepathia spastica" by Schmieden,[17] "spastic distention" by Newman,[18] "spastic dysfunction" by Lyon[19] and "physiologic block" by Smithies.[20]

What is the present status of the Doyon-Meltzer concept, which maintains that when the gallbladder contracts, the sphincter relaxes? It can be stated that the evidence obtained by the best methods supports this concept.[1] There is evidence showing that, when the sphincter contracts, the gallbladder fills, as might be expected. Whether this is due to a reciprocal nervous mechanism or is only passive is not settled. That the literature is not in agreement is not surprising when one views the intricacy of the possible mechanisms and recalls that many years were required to clear up the stomach-pyloric sphincter relationship.

The fact that the sphincter of Oddi becomes incompetent soon after removal of the gallbladder shows that the gallbladder has some functional relation to the sphincter. Later in most instances the sphincter becomes sufficiently competent to cause the ducts to dilate. Section of the sphincter prevents dilatation.[21] Certain other facts pertaining to the physiology and functional pathology of the sphincter of Oddi may be summarized as follows: (*a*) Any procedure that increases the muscular tone of the duodenum inhibits the flow of bile into the duodenum.[22] (*b*) Any procedure that decreases the tone of the duodenum favors the flow of bile. (*c*) Chemical irritation of the duodenum delays gallbladder evacuation. (*d*) Atropine favors the flow of bile into the duodenum and pilocarpine stops the flow of bile. (*e*) Morphine tends to inhibit the flow of bile into the duodenum, owing to its effect of increasing the tone of the circular muscle of the duodenum. (*f*) magnesium sulphate, magnesium oxide and sodium sulphate favor the flow of bile. (*g*) In some patients having cholecystitis or duodenal ulcer the sphincter may be hypertrophied.[23] (*h*) It is reported that some time

15. Ivy, A. C.; Voegtlin, W. L., and Greengard, Harry: The Physiology of the Common Bile Duct, J. A. M. A. **100**: 1319 (April 29) 1933. Ivy, A. C., and Sandbiom, P.: Ann. Int. Med., to be published.
16. Westphal, K.; Gleichmann, F., and Mann, W.: Gallenwegsfunktion und Gallensteinleiden, Berlin, Julius Springer, 1931.
17. Schmieden, V., and Niessen, H.: Verhandl. d. deutsch. Gesellsch. f. inn. Med., Kong. 44, 1932, p. 302.
18. Newman, C.: Lancet **1**: 785 (April 15), 841 (April 22), 896 (April 29) 1933.
19. Lyon, B. B. V.: Am. J. Dig. Dis. & Nutrition **1**: 18 (March) 1934.
20. Smithies, Frank; Karshner, C. F., and Oleson, R. B.: Nonsurgical Drainage of the Biliary Tract, J. A. M. A. **77**: 2036 (Dec. 24) 1921.
21. Mann, F. C.: Physiol. Rev. **4**: 251 (April) 1924.
22. Burget, G. E.: Am. J. Physiol. **81**: 422 (July) 1927. Lueth, H. C.: Am. J. Physiol. **99**: 237 (Dec.) 1931.
23. Giordano, A. S., and Mann, F. C.: The Sphincter of the Choledochus, Arch. Path. **4**: 943 (Dec.) 1927.

after cholecystectomy the sphincter may become competent or possibly undergo hypertrophy.[24] (*i*) In animals without a gallbladder the sphincter resistance is less than in animals having a gallbladder.[21]

It is known both from comparative physiology and by actual experiment that one of the functions of the sphincter is to fill the gallbladder, another function being possibly to prevent regurgitation of contents and transmission of pressure from the duodenum to the common duct.

On weighing the evidence pertaining to the relationship between the gallbladder and the sphincter of Oddi or the choledochoduodenal mechanism, we are convinced that the gallbladder and the sphincter constitute a functional unit. This concept was implied by Oddi in 1887 and was clearly stated by Doyon in 1894. This concept directly implies that serious consideration must be given to the sphincter of Oddi or the choledochoduodenal mechanism in order for the functional pathologic changes and the therapy of biliary tract disease to be understood.

TYPES OF EVACUATION

Those investigators who have devoted considerable time to the detailed study of the mode of gallbladder evacuation consider the gallbladder and sphincter of Oddi as a functional unit. This is exemplified in the types of evacuation that Boyden [25] has described for "normal" subjects and in the types of motor dysfunction described by Westphal and others.

Boyden,[25] who has studied by a quantitative method more than 100 "normal" human subjects, recognizes three types of gallbladder response to a fat meal. In the first type, a primary relaxation of the gallbladder results with what appears to be a closure of the sphincter. Only a temporary delay in emptying occurs. This type is relatively rare. In the second type, which is more common, contraction and evacuation start quickly with simultaneous relaxation of the sphincter, and evacuation occurs rapidly. This comprises the larger group of subjects, evacuation being complete (95 per cent) in two hours. In the third type, evacuation starts but, after an interval, stops. Then, filling of the gallbladder occurs. Further, evacuation occurs in successive phases. Boyden thinks that in this type the sphincter is primarily concerned in stopping the evacuation and starting the filling, since the speed of the initial evacuation is normal.

Westphal [26] has described two major types of motor dysfunction of the biliary passages.

I. Hyperkinetic:
   (*a*) Hypermotile: Increased motility of gallbladder and ampulla with rapid emptying.
   (*b*) Hypertonic: Contraction of the gallbladder against spasm of the sphincter with spastic distention and colicky pain.

II. Atonic: Relaxation or atony of the gallbladder with spasm of the sphincter of the papilla causing atonic distention of the gallbladder with mild continuous "heavy," aching sensation.

Westphal [26b] and Kalk [27] report that in from 10 to 20 per cent of patients who complain of biliary tract distress the distress is due to a motor dysfunction of the gallbladder and sphincter. These and other authors [17] including Aschoff [28] attribute the so-called stasis gallbladder to a functional motor disturbance. Newman [18] has cautioned against the division of motor dysfunctions into hard and fast entities and, we believe, properly so. However, we believe that the concept is sound from a physiologic point of view.

THERAPEUTIC CONSIDERATIONS

Prevention of gallbladder disease may be aided by the daily evacuation of the viscus by the appropriate intake of fat. This applies particularly to the gallbladder that evacuates slowly and incompletely but without causing symptoms. Such prophylaxis should be a part of antepartum care.

In acute biliary tract disease not demanding immediate operation, the employment of the physiologic principle of sedation has been and is effectively employed. Foods such as fats, meats and acid fruit juices which excite activity should be withheld. Magnesium sulphate or magnesium oxide, because of the relaxing effect of magnesium on the sphincter, may be used. Atropine or belladonna is indicated for the same reason. The advisability of using bile salts or dehydrocholic acid, in order to promote the formation of bile in these cases, is to be seriously questioned. If the obstruction is complete, or almost so, the pain or distress will be increased. This would be true even with the gallbladder out, since distention of the ducts causes distress.

If the sphincter or duodenum is hypertonic or irritable, the procedures that decrease intramural resistance are indicated. Fat (egg yolk, milk and cream) tends to decrease the tonicity of the duodenum as well as the stomach, but the amount to be used will depend on the condition of the gallbladder. If the gallbladder is atonic, fat will favor evacuation; but if the gallbladder is irritable, the fat intake will have to be adjusted to the "tolerance" of the patient.

It must be recognized, however, that there are patients having chronic cholecystitis whose gallbladders visualize poorly with or without one or more large stones present (by large we mean capable of causing impaction of but not capable of passage through the cystic duct) in whom fatty meals or "mayonnaise dressing" or fruits rich in organic acids, cause trouble; that is, these excitants in excess produce right hypochondrial distress, stitching pains or soreness in the region of the scapula, or even colic. In those patients who refuse operation, excitant foods must be reduced to meet the patient's tolerance. The "tolerance" can be ascertained only after careful dietary experimentation, a cooperative patient of fair intelligence being prerequisite. The gallbladder excitatory foodstuffs should not be eliminated from the diet entirely. Too much of the excitants will irritate the gallbladder, but absence of the excitants will cause stasis, and stasis must be avoided. These are the patients who, refusing operation and not being helped by the physician, we believe go to the drug store and purchase "pills" that contain a cathartic and bile salts. So far as is known, bile salts only increase the fluid volume of the bile, the total output of bilirubin and other biliary constituents being unaltered or slightly diminished. It is rational to believe that bile salts have a place in the therapy of chronic but not of acute biliary tract disease.

24. Westphal, Gleichmann and Mann.[16] Nuboer, J. F.: Frankfurt. Ztschr. f. Path. **41**: 496, 1931.
25. Boyden, E. A.: Anat. Rec. **40**: 147 (Oct. 25) 1928.
26. (*a*) Westphal, Gleichmann and Mann.[16] (*b*) Westphal, K.: Ztschr. f. klin. Med. **96**: 22, 52, 95 (Jan.) 1923; Verhandl. d. deutsch. Gesellsch. f. inn. Med., Kong. **44**: 354, 1932.
27. Kalk and Schondube.[13] Schondube, W.: Verhandl. d. deutsch. Gesellsch. f. inn. Med. Kong. **44**: 381, 1932.
28. Aschoff, L.: Verhandl. d. deutsch. Gesellsch. f. inn. Med. Kong. **44**: 26, 1932.

CHOLECYSTOSTOMY

It is well known that unless great care is taken, in the dog cholecystostomy always leads to infection of the biliary passages in from two to three weeks. Several reports are available in which cholecystography was done after cholecystostomy in man. Graham [29] found nonvisualization in all but one. Spurling and Whitaker [30] in twelve cases failed to find a normal cholecystogram. Fleming [31] studied thirty-six cases, one showing a normal shadow, six visualizing but having impaired function, and twenty-nine failing to visualize. The lack of preoperative cholecystograms makes it impossible in these cases to evaluate the effect of cholecystostomy. The evidence is strongly presumptive, however, that the gallbladder is not benefited by drainage. If the mucosa is not permanently damaged, the scarring incident to drainage may interfere with normal emptying.

CHOLECYSTECTOMY

It is now generally recognized that cholecystectomy is definitely indicated in patients with multiple small stones, and in cases of nonvisualization with a high grade chronic cholecystitis. If the gallbladder is so permanently injured that it does not visualize, from the physiologic point of view, a functional cholecystectomy has already been performed, and if it is harboring infection or stones no harm or change can result from cholecystectomy, if postoperative adhesions and surgical accidents are not considered.

As already pointed out, the removal of a gallbladder which concentrates leads to physiologic and anatomic changes in the biliary passages. For this reason, if for no other, the gallbladder cannot be viewed as a vestigial organ to be removed without adequate and justifiable reason. This statement will not stand unequivocally, however, unless it is supported by evidence showing that actual injury may result as a consequence of either an incompetent sphincter or a competent sphincter with a dilated duct. Unless it can be shown that cholecystectomy has actually a harmful effect, the operation will always be performed in borderline cases in which the gallbladder is suspected of being at fault.

In the dog, a cholecystoduodenostomy or a cholecystogastrostomy with or without gastro-enterostomy leads in the course of several months to an ascending biliary tract infection and hepatitis. The same is true in man. Apparently a normal sphincter of Oddi serves as a barrier against ascending hepatitis. Thus, following cholecystectomy, the presence of an incompetent sphincter favors regurgitation, or the presence of a competent sphincter and dilated ducts may favor stasis. Theoretically, infection might occur in either case unless the bile flow was always sufficiently copious to prevent regurgitation or stasis. In this connection, we have often wondered whether those patients (adhesion free) who have distress after cholecystectomy are (*a*) those who have an incompetent sphincter, (*b*) those who have a competent sphincter with dilation of the ducts, or (*c*) those who had a hypertonic or hypertrophic sphincter prior to the cholecystectomy. (Of course, the presence of a chronic infection of the ampulla and ducts must also be considered.) The only information that we have been able to find on this question is as follows: Zander [32] reports that spastic contractions of the sphincter of Oddi may occur after cholecystectomy. Rehn and Hoseman,[33] in a series of 215 cases, removed twenty-five stone-free gallbladders; of the twenty-five, seven presented symptoms accountable for by a spastic or hypertrophic sphincter. Westphal [26b] reports that residua remain in from 20 to 30 per cent of cholecystectomized patients. On duodenal drainage in these patients and after the instillation of oil, he obtains more highly pigmented stasis bile. As Giordano and Mann [23] and also Westphal [16] have pointed out, a spasm or hypertonic or hypertrophied sphincter may obstruct not only the outflow of bile but also of pancreatic juice in those patients (20 per cent) whose duct of Wirsung opens into the ampulla at a high level.

It should be pointed out that a patient having a hypertonic or hypertrophic sphincter may obtain temporary relief following a cholecystectomy, owing to the preliminary paresis of the sphincter that always results. But on recovery from the temporary paresis, the hypertonicity of the sphincter may recur and produce symptoms. It may or may not be possible to manage such patients medically. Whether section or dilatation of the sphincter, or choledochoduodenostomy or cholecystoduodenostomy with or without gastro-enterostomy is the operation of choice when medical management fails, we believe remains an experimental and clinical problem. Of course, if the ampulla, common duct or intrahepatic ducts are infected, the conditions are altered, and T tube drainage is, we believe, a rational procedure. This is of physiologic interest because the presence of inflammation in the crypts of the ampulla may increase the irritability of the sphincter and a relief of the inflammation by drainage may decrease the irritability of the sphincter.

What are the observed facts pertaining to the harmful effects of cholecystectomy? It is known that the cholecystectomized dog and man may live a long time in apparently good health. This may or may not be significant, because the factor of safety in digestion and in the liver is large. In man there is no information on the effect of cholecystectomy on the liver except that of Rost,[34] which is unsatisfactory. Without controls he thought that cholecystectomy caused hepatitis. In the dog there is one report [35] in which a slight hepatitis was found after cholecystectomy and another [36] in which hepatitis was not found. Rost [34] reports that pancreatic secretion and bile formation are decreased. In man, McClure [37] reports that in cases with cholecystectomy the pancreatic secretion is diminished, but no control studies were made before the operation.

Hence the evidence at hand is inadequate to warrant the statement that actual damage is done the patient by removing a gallbladder that visualizes and empties. The fact, however, that physiologic and anatomic changes do result following the removal of such a gallbladder should deter the surgeon at least until medical control has been tried. This fact also condemns the idea of prophylactic removal of the gallbladder or its

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31. Fleming, B. L.: Ann. Surg. **93**: 730 (March) 1931.
32. Zander, P.: München med. Wchnschr. **70**: 1173 (Sept. 14) 1923.
33. Rehn and Hoseman, cited by Aschoff.[28]
34. Rost: Mitt. a. d. Grenzgeb. d. Med. u. Chir. **26**: 710, 1913.
35. Troitzky, A. A.: Omsky, M. J. **4**: 21, 1929.
36. Halpert, Béla; Rewbridge, A. G., and Healey, Claire: Effects of Cholecystectomy on the Biliary System, Arch. Surg. **26**: 589 (March) 1933.
37. McClure, C. W., and Huntsinger, M. E.: New England J. Med. **201**: 1030 (Nov. 21) 1929, **206**: 507 (March 10) 1932.

removal on the basis of suspicion. The earlier the larval forms of cholecystopathy are recognized and controlled, the more the surgeon will be of the same opinion.

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STUDIES IN BILIARY TRACT DISEASE

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It is only slightly more than a decade ago that Rous and McMaster [1] published their observations on gallbladder function. Besides extending knowledge their work gave quantitative confirmation of much that had been done previously. Since then a great deal has been accomplished, as can be seen from the review recently published by Ivy; [2] but as yet knowledge of the normal and pathologic physiology of biliary function is incomplete. The excretory, secretory and absorptive functions of the liver and gallbladder and their associated ducts in health and in disease must of course be intimately correlated with the chemistry of the bile. It is with these aspects of function that we, as well as numerous other investigators, have concerned ourselves.

Under normal conditions the hepatic bile of the dog maintains a fairly constant chemical composition (figs. 1 and 2).[3] Although this is very likely true for man also, we cannot make this statement definitely, for we have only been able to study human hepatic bile over long periods in patients who presented surgical lesions of the biliary tract when first seen. However, hepatic bile obtained from the common duct of patients when complete or nearly complete hepatic restitution had

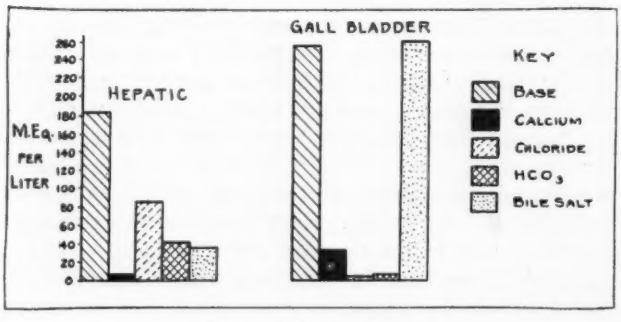

Fig. 1.—Normal dog bile.

taken place is, with the exception of the cholesterol concentration, similar to normal dog's hepatic bile in its composition. In human hepatic bile the concentration of cholesterol is significantly higher than it is in dog's bile.

When normal hepatic bile of dog or man is received in a normally functioning gallbladder, certain definite changes occur. Water is absorbed at a rate as high, in the dog, as 6.75 cc. per hour.[4] The chloride and bicarbonate are rapidly absorbed, so that there is a marked decrease of these substances both in absolute amount and in concentration in normal gallbladder bile. The concentrations of cholesterol and of bilirubin increase and there are no quantitative data which indicate that under normal conditions these substances are either absorbed or secreted in the gallbladder. The calcium and bile salts are concentrated, but small amounts of both these substances are absorbed. The bile normally becomes more acid during this process of selective concentration and absorption.

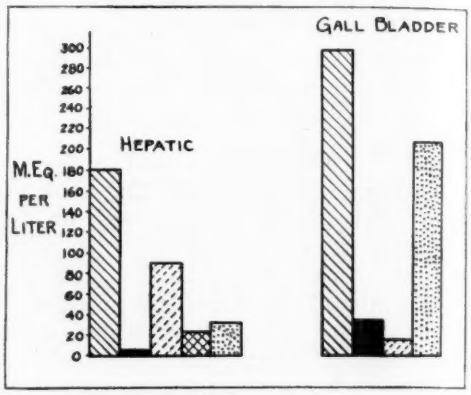

Fig. 2.—Normal human bile.

The part that such a mechanism plays in the body economy has been a much debated subject. The substances except water that are known to be absorbed from the normal gallbladder bile and returned to the blood are absorbed only in insignificant amounts, and there is no available evidence which indicates that any important substance is secreted by the normal gallbladder into the bile.

The fact that certain species are born without a gallbladder and that man can live a normal life span in apparently perfect health after its removal is, however, not in itself evidence that the normal viscus is unimportant in those species in which it is found. The data of McMaster,[5] who found that the rat, which has no gallbladder, secretes hepatic bile that contains eight times as much bilirubin as is found in the hepatic bile of the mouse, which has a gallbladder, and of Boyden,[6] who found that a cat in which the gallbladder was congenitally absent secreted bile with a bilirubin concentration 2.2 times as high as a cat whose gallbladder was present, are of interest in that they demonstrate an ability of the liver under such circumstances to secrete a more concentrated bile.

Ivy,[2] who has reviewed the available data carefully, has concluded that "the gallbladder is a factor of safety in physiological economy." If this is true, and we believe that it is, the normal organ should not be removed with the same impunity that one would remove a so-called chronically diseased appendix.

When the gallbladder becomes damaged by trauma or infection, certain significant changes occur in the composition of gallbladder bile (figs. 3 and 4). There may result merely a retardation in the rate of absorption and concentration. From this simple change one may find all types of perversion of function until, in the

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Read before the Section on Surgery, General and Abdominal, at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 15, 1934.

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3. Ravdin, I. S.; Johnston, C. G.; Riegel, Cecilia, and Wright, S. L. Jr.: Am. J. Physiol. **100**: 317 (April) 1932.
4. Ravdin, I. S.; Johnston, C. G.; Austin, J. H., and Riegel, Cecilia: Am. J. Physiol. **99**: 638 (Feb.) 1932.
5. McMaster, P. D.: J. Exper. Med. **35**: 127 (Feb.) 1922.
6. Boyden, E. A.: Proc. Soc. Exper. Biol. & Med. **27**: 86 (Nov.) 1929.

severely damaged gallbladder, fluid flows into its lumen instead of being absorbed from it, and other substances previously absorbed may be secreted into it, while substances that were only concentrated may be absorbed.[7]

For purposes of discussion we have divided the patients whose gallbladder bile we have studied into three groups: (1) patients having chronic cholecystitis without calculi, (2) patients having chronic cholecystitis

TABLE 1.—*The Gallbladder Bile in Chronic Cholecystitis Without Calculi*

Patient	Calcium, Mg. per 100 Cc.	Chloride, Mg. per 100 Cc.	Bile Salt, Mg. per 100 Cc.	Cholesterol, Mg. per 100 Cc.	Bile Salt-Cholesterol, Mg. per 100 Cc.
Ar.	37.0	145.5	5.990	176	34.0
Ma.	27.8	344.7	1,920	242	7.9
Ba.	18.0	191.7	2,090	384	5.4
Pe.	60.0	92.7	3,740	122	30.6
Su.	39.4	150.5	0	133	
Gr.	20.0	375.6	0	40	
Sc.	24.8	203.4	3,000	303	9.9
Hu.	21.6	214.8	1,090	78	13.9
He.	26.6	113.2	1,650	148	11.1
La.	45.6	93.4	2,080	744	2.8

with calculi and (3) patients having abnormal calcium deposits in the gallbladder wall or lumen.

In patients with proved chronic cholecystitis without calculi the change in the chemical composition of the bile is often not very great, although definite exceptions were found. In most of the specimens of bile from a chronically diseased noncalculous gallbladder that we have studied we have found evidence of concentration of calcium or bile salt, or both, whether or not the gallbladder was visualized after the administration of tetraiodophenolphthalein sodium. A few of the representative data are given in table 1.

Of the patients with chronic cholecystitis with calculi, two general types present themselves (table 2): (A) Patients whose gallbladders are visualized after the administration of tetraiodophenolphthalein sodium. In these evidence of the concentration of calcium and to

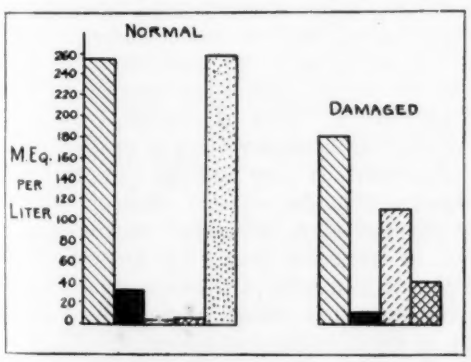

Fig. 3.—Dog gallbladder bile.

a lesser degree of bile salts was also as a rule obtainable. (B) Those whose gallbladders were not visualized after the administration of the dye. Although evidences of the concentration of calcium and at times of bile salts were found, the data as a rule show a greater deviation from the normal than do those of the previous groups.

7. In all references in this paper to the determination of bile salts the analyses were made by the Gregory-Pascoe method.[23] Both free and conjugated cholic acids respond with a characteristic color reaction, although desoxycholic and perhaps other naturally occurring bile acids cannot be determined by this method. Experiments now being conducted in this laboratory suggest that, even when the typical Gregory-Pascoe reaction is not obtained, some free or conjugated bile acids may be present but the reaction may be masked.

The data we have collected from bile specimens obtained from gallbladders falling in these groups indicate that with increasing impairment of function there was generally an increasing tendency for the bile to become more dilute in some materials and more concentrated in others. This may be due to retardation of water and solute absorption, to dilution of the hepatic bile after the gallbladder receives it, or to the addition of substances as fluid flows into the gallbladder lumen. In general it may be said that the concentrations of calcium and of bile salt show a progressive decrease with increasing severity of damage, the latter being

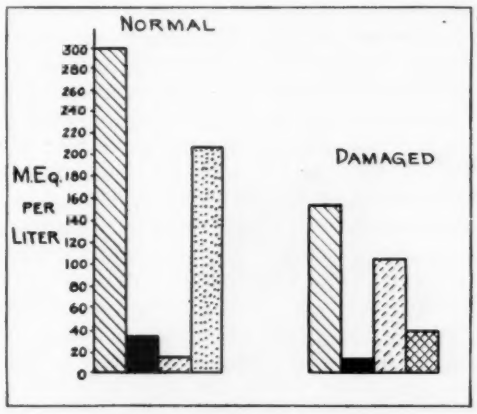

Fig. 4.—Human gallbladder bile.

measured by evidence obtained from cholecystographic studies. The larger number of low values for both calcium and bile salts were obtained in the group having the most severely damaged gallbladders. The chloride concentrations, on the other hand, show a progressive tendency to increase in concentration with increasing

TABLE 2.—*The Gallbladder Bile in Chronic Cholecystitis with Calculi*

Patient	Calcium, Mg. per 100 Cc.	Chloride, Mg. per 100 Cc.	Bile Salt, Mg. per 100 Cc.	Cholesterol, Mg. per 100 Cc.	Bile Salt-Cholesterol, Mg. per 100 Cc.
Gallbladder Visualized After the Administration of Tetraiodophenolphthalein Sodium					
Ba.	24.0	290.2	0	339	
Sm.	46.0	211.8	3,600	400	9.0
Bro.	54.0	130.8	1,320	759	1.6
Bra.	27.2	205.5	1,330	278	4.4
Fo.	....	209.3	1,875	377	4.9
Os.	28.0	275.3	3,120	368	8.8
Gallbladder Not Visualized After the Administration of Tetraiodophenolphthalein Sodium					
Li.	26.0	186.6	83	787	0.1
Ka.	....	298.1	3,080	312	9.6
Al.	27.0	321.6	1,250	121	10.3
Ja.	11.0	363.3	0	42	
Se.	26.0	351.8	0	98	
Mi.	12.2	328.7	708	242	2.9
Ch.	50.0	489.3	0	26	
Fo.	15.0	268.5	1,460	356	4.1

evidence of a perversion of function, the highest values being found in the group having chronic cholecystitis with calculi and in which the gallbladder did not visualize after the administration of tetraiodophenolphthalein sodium.

The cholesterol concentration varied greatly and in the data given here appears to vary as a rule with the bile salt concentration; i. e., the lowest value for cholesterol was found when no bile salt was demonstrable, and many of the highest values for cholesterol were found in bile having the highest bile salt concentration.

However, there were exceptions to the latter, and it was not possible to show a definite linear relationship between the variations in the two constituents. The evidence strongly suggests that cholesterol may be secreted into the gallbladder bile in at least some of the damaged gallbladders, because the concentration of cholesterol in some instances was considerably higher than in normal hepatic bile, and there was at times no evidence of the concentration of other constituents normally concentrated in the gallbladder bile. This is at least partially in agreement with the data reported by Elman and Graham.[8] Data that we have obtained in the dog would appear to corroborate this concept.

The relationship of these changes to the failure of the gallbladder to visualize in cholecystography is of some interest. Frequently the roentgenologist reports the nonvisualized gallbladder as a "nonfunctioning gallbladder," which implies a static condition of the gallbladder wall. In reality the dye in the hepatic bile may be further diluted on reaching the gallbladder by a viscus whose function is perverted, or it may be more rapidly absorbed than it is under normal circumstances. Both of the mechanisms tend to prevent visualization, but they are evidences of a perversion of function which is a dynamic process rather than of loss of function.

In the third group the outstanding feature is the increase in the amount of calcium that may be found in the gallbladder. The gallbladder may be filled with a white fluid "kalkmilch" consisting largely of calcium carbonate, or there may be a gelatinous mass filling the gallbladder in which streaks of this emulsion together with calcium carbonate stones may be found. There may be a single stone obstructing the cystic duct either covered on one side or surrounded by a small or large amount of calcium carbonate (figs. 5 and 6). These lesions have been described and discussed by Willich,[9] Volkmann[10] and Phemister and his associates.[11] In still another type the calcium may be precipitated in the gallbladder wall as described by Jones and Palmer[12] (fig. 7).

With the exception of those showing merely calcification of the gallbladder wall, the condition is generally associated with cystic duct obstruction, but no adequate explanation has been advanced to explain the large amounts of calcium often found in these gallbladders. Several years ago we[13] called attention to the fact that the increase in the alkalinity of the bile in a damaged gallbladder and the high bicarbonate present in certain specimens of gallbladder bile in disease provided favorable conditions for the precipitation of calcium. If the calcium is secreted by the gallbladder wall in these cases, fluid must enter the gallbladder with it. We have previously reported[14] that in hydrops of the gallbladder the fluid pouring into the lumen of the gallbladder has a calcium concentration of from 5 to 10 mg. per hundred cubic centimeters. This agrees with the data reported by Fowweather and Collinson,[15] who found calcium concentrations of from 2.8 to 15 mg. per hundred cubic centimeters in "white bile" from the human gallbladder. It may be that there are periods of increased damage of the wall when fluids pour in and periods of a return to more normal function when fluids are absorbed, the calcium remaining behind. Murphy and Bollman[16] have reported evidence which demonstrates that the gallbladder may again concentrate after recovery from acute cholecystitis.

The low bile salt concentrations frequently found in bile from a damaged gallbladder and previously reported by Rosenthal and Licht,[17] Newman,[18] Andrews, Schoenheimer and Hrdina[19] and by us[20] have been used, together with the cholesterol concentration, in obtaining a bile salt-cholesterol ratio. The formation of certain gallstones has been attributed to deviation of this ratio from the normal, the cholesterol precipitating out of the bile when the bile salt concentration falls below a critical level. Newman[21] has reported that the bile salt-cholesterol ratio normally is about 18, whereas "in bile from gallbladders with faceted stones it is 2.5 and in bile from gallbladders containing calcium pigment stones it is normal. Of the bile salt-cholesterol ratio in cases of cholesterol solitaire stones nothing is known."

TABLE 3.—*Bile Salt-Cholesterol Ratio in Various Types of Stones*

Patient	Bile Salt, Mg. per 100 Cc.	Cholesterol, Mg. per 100 Cc.	Bile Salt-Cholesterol, Mg. per 100 Cc.	Type of Stones
Ri.	2,370	344	6.8	Calcium pigment
Ka.	3,080	312	9.8	Calcium pigment
We.	2,280	445	5.1	Faceted
Go.	658	88	7.4	Faceted
Da.	0	277	...	Faceted
Sm.	3,600	400	9.0	Faceted
Si.	1,030	625	1.7	Faceted
He.	1,000	78	12.8	Cholesterol solitaire
Fo.	1,875	377	5.0	Cholesterol solitaire
Ar.	930	136	6.8	Cholesterol solitaire

In table 3 are given data which demonstrate that the matter is not nearly so simple. Data previously reported in this paper show a wide variation of the bile salt-cholesterol ratio even in noncalculous gallbladders. There is no doubt that bile salts are often completely or nearly completely absorbed from the damaged gallbladder. This may occur, however, without the entire bile cholesterol being precipitated from the bile. Nor can one state that the bile removed from the damaged gallbladder on one occasion may not be markedly changed at a subsequent examination. The perversion of function needs by no means remain static, as the data in table 4 demonstrate. One has no right to conclude that calculi were formed under the conditions of the bile found at operation. The evidence we have collected would seem to demonstrate that the gallbladder bile may be profoundly altered when only a cholesterol solitaire stone is found in the gallbladder, a condition which many believe is purely metabolic in origin. Trauma of the mucosa alone may alter the concentrating activity of the gallbladder to an unusual degree.

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We have studied the chemistry of human gallbladder bile removed at operation and the chemistry of the stones found in the same gallbladder. The data are of little significance in that stones of different chemical composition are found bathed in bile of strikingly similar character while stones of the same type are often found in bile whose composition is not similar.

TABLE 4.—*Gallbladder Bile at Two Stages in the Same Patient*

Date	Calcium, Mg. per 100 Cc.	Chloride, Mg. per 100 Cc.	Cholesterol, Mg. per 100 Cc.	Bile Salt, Mg. per 100 Cc.
September 1933	16.6	300.0	277.0	0.0
April 1934	27.0	209.3	368.0	60.0

In the acutely inflamed gallbladder with stones in which the cystic duct becomes obstructed, marked changes in the composition of the bile are found long before empyema occurs (table 5). The greatest changes are found in the gallbladder of hydrops, in which the fluid removed has not the faintest visual resemblance to gallbladder bile. The calcium concentrations show a further tendency to decrease, while the chloride concentrations are consistently higher. It is in this type of gallbladder that the bile only rarely contains even a trace of bile salt. Nonprecipitated cholesterol is found

TABLE 5.—*Acute Cholecystitis with Stones*

Patient	Calcium, Mg. per 100 Cc.	Chloride, Mg. per 100 Cc.	Bile Salt, Mg. per 100 Cc.	Cholesterol, Mg. per 100 Cc.	Bile Salt-Cholesterol, Mg. per 100 Cc.
Sa	10.0	477.1	31	81	0.4
La	13.4	290.5	0	115	
Ho	8.0	331.5	83	55	1.5
Ha	14.4	464.1	0	27	
Ca	9.6	325.2	0	0	
Sh	21.4	390.6	0	—	

in the fluid contents of the gallbladder even though the bile salts are absent. The rapidity with which such a gallbladder permits bile pigment to be absorbed while the normal gallbladder completely retains this substance is a striking example of the degree of perversion of function that may take place in disease. The acutely inflamed gallbladder pours fluid into its lumen so that even though the cystic duct is open the gallbladder will not be visualized cholecystographically, although later with a subsidence of the inflammation this may be possible.

TABLE 6.—*Hepatic Bile in Cholangeitis*

Patient	Calcium, Mg. per 100 Cc.	Chloride, Mg. per 100 Cc.	Bile Salt, Mg. per 100 Cc.
Wa	3.2	532.7	0
Cr	9.2	294.7	0
He	7.6	385.0	0
Wi	4.2	427.4	0

We had observed several years ago that, when cholangeitis [3] occurred in dogs whose hepatic bile was previously normal, the bile salt concentration of the hepatic bile as measured by the Gregory-Pascoe reaction [22] decreased markedly. This finding we have now confirmed in man (table 6). The evidence we had obtained led us to state that our data at least suggested that the liver bile was the sole site for the synthesis of bile salts. The calcium levels in hepatic bile from patients with cholangeitis tend to be below the normal hepatic bile level, while the chloride level is in general above the normal level. In these respects the data from both man and dog are in agreement. The cholesterol concentration of hepatic bile increases in cholangeitis, and this would appear to be related to the degree of suppuration and the exfoliation of mucosal cells.

When the common bile duct becomes obstructed either completely or partially from stone, tumor or cicatricial stenosis, the hepatic bile becomes altered in its composition. The most profound changes occur when the obstruction is complete and the pressure in the bile ducts exceeds the hepatic secretory pressure. The "white bile" found in many of these patients needs little comment. It is present only because the hepatic parenchyma no longer is functioning normally and is the result of the activity of the mucosal cells lining the ductal system.

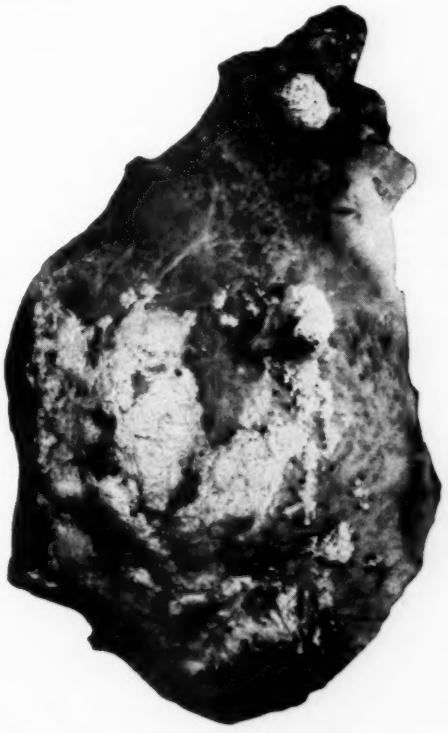

Fig. 5.—Calcium precipitation in the gallbladder lumen; calculus obstructing the cystic duct.

The extent of the change in the hepatic bile depends on the extent and the duration of the obstruction, the degree of associated infection and the presence or absence of a normally functioning gallbladder. When the obstruction is complete and there is a coincidental cholangeitis together with a severely damaged gallbladder, the changes in the hepatic bile appear early and are most marked.

The most striking finding in the hepatic bile obtained by common duct drainage after the release of a ductal obstruction is the reduction of the bile salt concentration as measured by the Gregory-Pascoe reaction [22] (table 7). Greene, Walters and Fredrickson [23] several years ago reported studies on the common duct bile after release of partial and complete obstructions of the common duct.

Although Greene, Walters and Fredrickson found a reduction of the bile salts as measured by the Aldrich-

22. Gregory, R., and Pascoe, T. A.: J. Biol. Chem. **83**: 35 (July) 1929.

23. Greene, C. H.; Walters, Waltman, and Fredrickson, C. H.: J. Clin. Investigation **9**: 295 (Oct.) 1930.

Bledsoe method, in hepatic bile after ductal obstruction we have found an absence of the bile salts as measured by the Gregory-Pascoe reaction in specimens of hepatic bile collected from the common duct, when the obstruction has persisted for one week or more, and the gallbladder contained calculi.

TABLE 7.—*Hepatic Bile After Common Duct Obstruction*

Patient	Calcium, Mg. per 100 Cc.	Chloride, Mg. per 100 Cc.	Bile Salt, Mg. per 100 Cc.	Cause of Obstruction	Days Obstructed
Br.....	6.8	280.0	0	Stone	20
Sh.....	10.8	472.0	116.5	Stone	4
He.....	7.8	353.5	0	Stone and cholangeitis	21
St.....	5.0	347.6	0	Stricture	18
Je.....	8.0	355.6	0	Stone	6
An.....	6.8	358.3	0	Stricture	5
Ta.....	4.6	363.9	0	Stone	12
Do.....	4.0	463.1	0	Stone	40

An intimate experience with a number of such cases has led us to the conclusion that the interval between release of the obstruction and the reappearance of bile salt in the liver bile is directly related to the degree and duration of the obstruction and to the degree of cholangeitis associated with the obstruction. The time of the reappearance of the bile salt may, we believe, be used as an indication of a return to normal liver activity.

The hepatic bile obtained after the release of an obstruction of the common bile duct has for a variable period of time a base concentration below that of the serum. The calcium fraction is in nearly every instance also low. The concentrations of both these substances tend to approach the blood level as the condition of the liver improves.

Fig. 6.—Calcium precipitation in the gallbladder lumen.

A very marked rise in hepatic bile chloride was often seen in patients who died after the release of an obstruction of the common bile duct. This finding has been so consistent that we have come to look on the return of the chloride concentration to the normal plasma level as indicative of improving functional activity of the liver and an increase in this concentration as of serious prognostic import.

The study of bile obtained from a number of sources after the institution of common duct drainage has convinced us that if the drainage was to remain until the bile was normal this objective was frequently not attained. In fact, drainage was often stopped before chemical evidences of any considerable degree of return to normal hepatic function were found.

It may be supposed that the loss of the total bile for short periods may rapidly result in a profound salt disturbance of the body. The calcium, sodium and chloride loss in the absence of cholerrhagia is not so great, however, but that these can be adequately taken care of in the ordinary dietary, reinforced if necessary by the parenteral administration of sodium chloride. The fluid loss can also be adquately compensated for.

It is well known, however, that total bile diversion from the intestine for long periods is accompanied by serious consequences. More important than base and chloride is the loss of bile salts. From the standpoint of intestinal function the bile salts are of the greatest

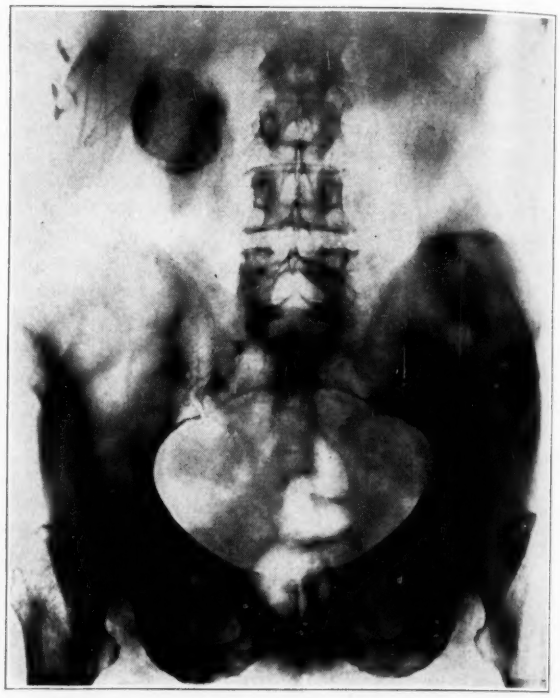

Fig. 7.—Calcium precipitation in gallbladder wall.

importance. They aid in the activation of various lipases and in the emulsification and the transport of fat so that their loss from the intestine, even for short periods, seriously interferes with the known important extrahepatic functions of the bile.

We have no doubt that certain of the asthenias which are observed after the release of ductal obstructions and common duct drainage are associated with an interference of the processes of digestion and absorption. With this view in mind we have for several years made it a routine practice daily to place from 150 to 300 cc. of the drained bile into the duodenum through a Jutte tube. This method deserves a more widespread use in the postoperative therapy of common duct operations when bile diversion is taking place. Whether any other important substances are present in the bile that improve the condition of the patient cannot at this time be answered.

A better knowledge of the changes that are associated with disease of the biliary tract either in part or as a whole may, we hope, lead to better methods of preoperative and postoperative treatment and perhaps even to changes in the operative attack.

CONCLUSIONS

We have presented data showing certain changes that occur in the chemistry of the bile in various surgical lesions of the biliary tract.

These data demonstrate the direction of the changes from the normal chemistry of the bile which take place when either the liver or the gallbladder is damaged.

With increasing evidence of disease of the gallbladder wall there is in general a greater change in the chemical constitution of gallbladder bile from the normal.

Evidence is presented in relation to the bile salt-cholesterol ratio which, we believe, demonstrates that while a change in this ratio may be a factor in gallstone formation it is not the sole etiologic factor.

The changes that normally take place in hepatic bile once it enters the gallbladder are considerable. We subscribe to the concept that in man the gallbladder plays an important rôle in physiologic economy and should not be removed without definite evidence that its function is impaired.

When the liver becomes damaged either by infection or by obstruction of the extrahepatic bile ducts, profound changes occur in the chemical composition of hepatic bile.

Surgical drainage of the common duct is very often not continued until the composition of the hepatic bile returns to anywhere near normal values.

Of major importance when the hepatic bile is being drained exteriorly is the consideration of the extrahepatic functions of the bile. We believe that the daily feeding of bile to such patients aids materially in the rapidity with which convalescence may take place and in the prevention of asthenia in the patient whose hepatic bile is being drained over long periods.

3400 Spruce Street.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. GRAHAM AND MACKEY, IVY AND BERGH, AND RAVDIN, RIEGEL, JOHNSTON AND MORRISON

DR. DONALD GUTHRIE, Sayre, Pa.: The present state of knowledge of liver function and of liver duct and gallbladder disease is due largely to the brilliant work of the physiologist, the biochemist and the experimental surgeon. This rapid advance in knowledge of these problems has armed the internist and the surgeon with safer methods of preoperative and postoperative treatment and has been responsible for better surgical procedures. In my clinic I have followed the suggestion of Dr. Ravdin and his associates of returning the bile loss in the presence of obstruction into the patient's gastro-intestinal tract and have found it a wise and helpful procedure: I also believe that the reappearance time and the concentration of the bile salts are valuable tests for the return of liver function. I agree with Drs. Graham and Mackey as to conservatism in management of the stoneless gallbladder, for the worst results have been in these unfortunate patients who remain in poor health or who have been made worse by the operation. One must be sure that the gallbladder disturbance is giving the patient the major part of his symptoms. These patients must give a history of one or more typical attacks before I will accept them for operation. Many of them may be helped by the medical measures suggested by Drs. Ivy and Bergh. I accept their idea of the choledochoduodenal system and I believe that disturbances in this system will explain not only many of the preoperative symptoms but also many of the unsatisfactory results that one sees after operation. In the presence of chronic gallbladder disease, duct disease, hepatitis, duct infections, duct obstructions and pancreatitis of various degrees, permanent damage has already been done to one or more of the important functions of the liver before the patient comes for relief by surgery. Gallbladders or stones may be removed and obstructions of the ducts may be relieved, but the damage that has already taken place in this complicated hepatic system cannot be repaired. Are not many of these unsatisfactory results following operation due to this fact, as well as to dysfunctions in the choledochoduodenal system?

DR. URBAN MAES, New Orleans: At the New Orleans session of the American Medical Association, Dr. Ravdin made a statement in discussing a group of gallbladder papers to the effect that, after operations for biliary obstruction, bile salts are always absent from the bile for a time. Dr. Frederick F. Boyce of my staff in a series of experiments corroborated Dr. Ravdin's statements and added some observations. In studying obstruction of the biliary system by stone as compared with obstruction by carcinoma of the head of the pancreas or within the ampulla, Dr. Boyce found that in all the cases of malignancy observed the bile salts reappeared within a shorter period of time and their concentration progressed more rapidly than when the obstruction was due to stone. In all the cases of malignancy the duration of the obstruction was longer than in obstruction by stone and therefore we surmise that the infection of the intrahepatic biliary system which is an almost constant accompaniment of obstruction by stone is the factor responsible for both the delayed reappearance of the bile salts and for their slower concentration, although we realize, of course, that increase of pressure within the biliary system also plays a part. We have observed two special groups of patients. In one, typical gallbladder symptoms were associated with a marked enlargement of the liver, while in the other the x-rays without the use of dye showed a gallbladder characterized by thickening and stagnation. In both instances amebiasis could be demonstrated, and in both specific treatment for it resulted in complete relief of symptoms. The infectious processes undoubtedly are very important in the pathology of the stoneless gallbladder and I am convinced that the presence of an unsuspected and therefore undetected intrahepatic amebiasis may be responsible for some failures in the treatment of gallbladder disease.

DR. GEORGE A. HENDON, Louisville, Ky.: There has been a dispute concerning the advisability and feasibility of cholecystectomy. I have perhaps hit upon a plan by which this may be compromised. I have observed in clinical work that the gallbladder is more diseased at its fundus, and as one gets down toward the cystic duct one will find more durable gallbladder tissue. Therefore, on being confronted with conditions indicating that the gallbladder should be removed, I avoid the hazard of including or injuring the common duct as well as the hazard of hemorrhage from the cystic artery by leaving a small amount of gallbladder toward the cystic duct. I then pucker this together with a catgut ligature and leave one end of it long. I employ a tube about half an inch in diameter and cut it fishtail shaped at one end. By means of a long, straight needle, which is carried up inside the tube and brought out on one side, one can draw the puckered-up remains of gallbladder inside this tube, and while the long piece of ligature is being held taut by the assistant one can go down and sew both sides of the fishtail very snugly round the remnants of gallbladder. In this manner one preserves some gallbladder and avoids the hazards of injuring the common duct and provides for drainage. It matters not how well the cystic stump is ligated, there is always a little leakage of bile, at least in my experience, but if that occurs in this case it comes out through the tube that envelops the gallbladder stump. In the hepatic system that has become infected, drainage is the chief reliance and I do not mean drainage in the accustomed sense; I mean it in a broader and more philosophic sense.

DR. I. S. RAVDIN, Philadelphia: I think that Dr. Maes is right when he states that the rapid disappearance of bile salts in patients having obstruction of the bile ducts is probably largely associated with the cholangeitis rather than the simple obstruction itself. The most rapid period of time in which the bile salts disappear in the dog are in those instances in which cholangeitis is present together with obstruction. My associates and I did not present in this study patients who probably were suffering from dyskinesic lesions of the biliary tract. Lesions that affect the motor function of both the gallbladder and the extrahepatic bile ducts may also result in definite alterations in the chemistry of gallbladder bile. These are, however, not surgical lesions and the removal of such a gallbladder undoubtedly accounts for the relatively low proportion of good results that are obtained in noncalculous gallbladders. In regard to Dr. Hendon's statement of his method for attacking the gallbladder, if one permits even the smallest amount of gallbladder tissue to remain above the level of the highest heisterian valve some degree of gallbladder function

will continue and one cannot be sure that calculi will not reform. I believe, therefore, that it is essential that the surgeon go just as far down as possible. The technic that Dr. Hendon described may be used in a difficult case, but it should not be used as a routine practice in cholecystectomy.

DR. EVARTS A. GRAHAM, St. Louis: With reference to the point mentioned by Dr. Maes about obstruction of the common duct by malignant disease and by stone respectively, about ten years ago I observed that patients who have an obstruction of the common duct by malignant disease show a small amount of retention of phenoltetraiodophthalein in the blood stream, as compared with those who have an obstruction by stone. This is probably not a specific property of phenoltetraiodophthalein but would probably hold for any of the dyes that are used for so-called tests of liver function. I attribute this difference to the fact that in the cases of obstruction by stone one is dealing with an infection of the liver and in obstruction by malignant disease the amount of infection in the liver is insignificant. For ten years I have used this procedure with great help in the differentiation between obstruction by malignant disease on the one hand and by a stone on the other. The method used is described in my book on diseases of the gallbladder, published in 1928. I feel that it is practically always possible by means of a simple dye reaction, estimating the amount of dye retention in the blood stream after a certain period of time, to determine whether or not an obstruction is due to malignant disease or to a stone, except in those rare instances in which both conditions are present. It occasionally happens, of course, that one has a stone in the common duct in addition to a carcinoma, perhaps at the biliary ampulla, and in such cases one will get the reaction like that of stone rather than like that of malignant disease, because the infection associated with the stone overshadows the simple picture of obstruction by malignant disease.

DR. A. C. IVY, Chicago: I have nothing more to add, but I was pleased to find Drs. Graham and Mackey as conservative as I believe I am in regard to cholecystectomy.

FOOT IMBALANCE

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The problem of foot imbalance is one concerning which so much has been written that it would seem impossible to add anything new to the available literature dealing with its solution. Yet in spite of this voluminous literature the fact remains that the incidence of foot disorders due to foot imbalance is steadily mounting; moreover, the management of these disorders seems to be falling more and more into the hands of quacks, shoe salesmen and the manufacturers of various forms of arch supports. It appears then that the medical profession is failing in some way to meet the situation and that there is need of taking a more practical attitude toward this problem than has been held in the past. Admittedly, the treatment of foot conditions is troublesome, is uninspiring, and may even by some seem to be beneath the dignity of the profession, savoring too much of the chiropodist; yet foot imbalance is a health condition that is vitally affecting the efficiency and well being of a very considerable number of people and is well worthy of the thoughtful consideration and study of any physician. It is my object to present some practical facts that have proved helpful in the treatment of foot imbalance in the clinic.

In the space allotted it is impossible to consider even briefly the anatomic and physiologic aspects of foot imbalance, nor will it permit of discussion of the etiology; for information on these subjects the reader is referred to the literature. This discussion will limit itself entirely to the diagnosis and treatment of the commoner forms of foot disorders.

From the clinical point of view it may be stated that there are two basic forms of foot imbalance: (1) the so-called flat or pronated foot with a low longitudinal arch and (2) the high arched, adducted foot with a contracted plantar fascia and prominent ball. The combinations and variations of these two basic types are almost infinite in variety, but for practical purposes these two forms may be considered as presenting all the problems requiring solution in the treatment of simple foot imbalance.

Fig. 1.—Type 1, the so-called flat or pronated foot, with a low longitudinal arch.

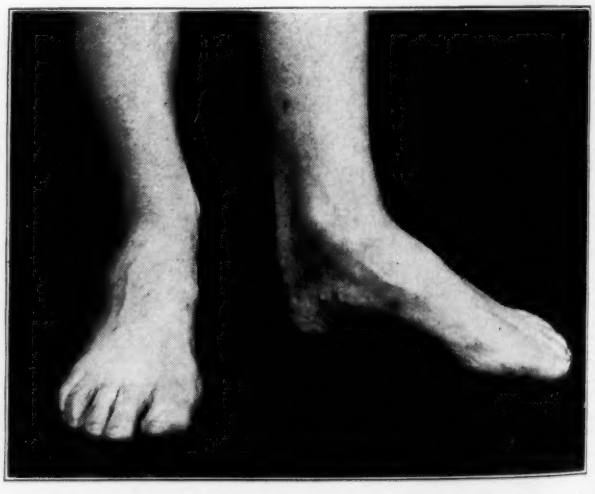

Fig. 2.—Type 2, the high arched foot, with a contracted plantar fascia and prominent ball.

DIAGNOSIS

The flat or pronated foot has as its principal characteristic the attitude of pronation to a varying degree and a depression of the longitudinal arch. As the body of the foot is adducted the forepart tends to adduct, resulting in a prominence of the scaphoid and internal cuneiform bones. The heel tendon and peroneal muscles are generally short or contracted, the former being

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displaced laterally; this abnormal pull tends to increase the inversion of the foot.

In this type of foot a tired feeling and pain in the calf of the leg is the first symptom complained of. Later the pain is localized in the midtarsal region and through the instep; in extreme cases pain is distributed over the entire foot and various deformities evidence themselves.

The high arched type of foot is characterized by a high longitudinal arch with little or no pronation and a prominence of the ball of the foot. The heel tendon is generally short and spastic, the plantar fascia is tight and contracted, and the greater portion of the body weight is borne on the ball of the foot. With this type of foot is generally associated a fallen or depressed metatarsal arch with callosities, Morton's toe and hammer toe.

Pain in the high arched foot is usually localized in the ball of the foot; cramping at the base of the toes and pain in the calves of the legs are frequently complained of and at times pain through the instep or ankle may be added.

Fig. 3.—Fallen anterior arch with marked callosity formation, generally associated with the high arched type of foot.

TREATMENT

The aim of treatment in foot imbalance is to correct the faults present and thus make the foot as a whole work in an approximately normal manner so that each part functions properly. Thus one replaces the inharmonious and faulty action which must result when the foot is out of balance with some parts doing more than their share of work and others less than theirs.

Before the imbalanced foot can be brought into its correct posture, an accurate estimation of its faults must be made by a careful examination. To facilitate this examination I have found a special foot examining stand, which places the feet on a level with the examiner's eyes as he is seated in front of the patient, most efficient and helpful.

This examining stand or platform is some 3 feet square and 20 inches high; on it is mounted a chair. Threaded from beneath the stand is a roll of ordinary white wrapping paper, which runs through a slot in the back of the platform beneath the chair and forward to the front of the stand. The loose end is held in a slot made on the front edge of the stand by a thin steel bar, which holds the paper in place and acts as a sharp edge on which to tear and remove the used pieces of paper. This allows a clean portion of paper for each patient on which diagrams and pedigraphs can be made. A roll of adhesvie plaster is held on a rack on the front face of the stand and a drawer just beneath this rack contains small instruments and measuring devices. A combination step and seat allows the patient to mount the examining stand and also serves the examiner as

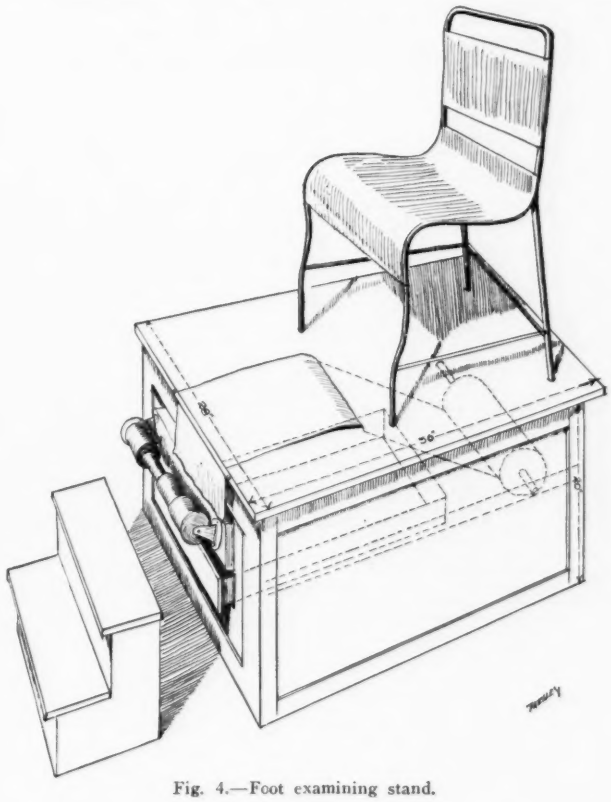

Fig. 4.—Foot examining stand.

a seat. With the patient standing or seated on the examining platform, the foot may readily be inspected in various positions and departures from the normal noted. Some systematic method of examination should

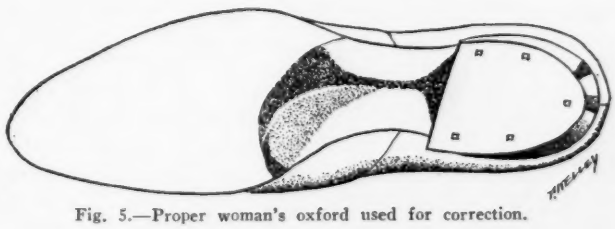

Fig. 5.—Proper woman's oxford used for correction.

be followed and the observations recorded with exactness for future reference and comparison.

After the type and needs of the particular foot under examination have been decided on, the first step toward

correction is the ordering of a proper shoe, since this is the foundation on which correct balancing measures must be built. There are many different theories as to the proper type of shoe for the human foot; I do not propose to go into a discussion of the various types

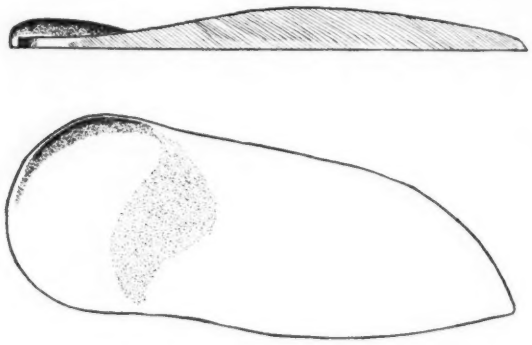

Fig. 6.—Stock sponge rubber inlay.

of footwear but wish merely to state that I have found that a shoe embodying the following characteristics gives the most uniform and satisfactory results:

1. The shoe should be of a bal or blucher oxford type.

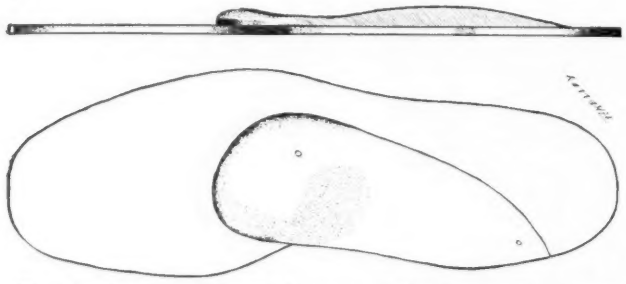

Fig. 7.—Shape, contour and placement of "flat foot type" of sponge rubber inlay.

2. It should have straight lines along the inner side and should curve not too abruptly backward on the outer side of the toe.

3. There should be ample room in the cap and ball of the shoe for normal function of the metatarsal arch and the toes.

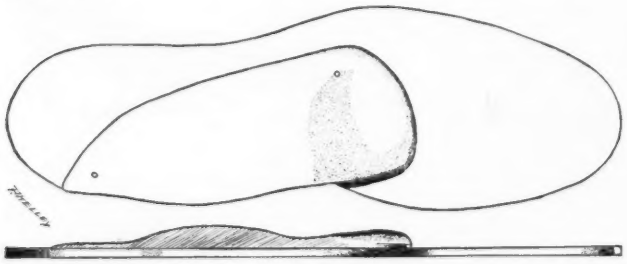

Fig. 8.—Shape, contour and placement of "high arched type" of sponge rubber inlay.

4. The sole should be of the flat type and sufficiently heavy to give protection and support.

5. The heel should be of the straight side type, preferably extending slightly forward on the inner side of the shoe; height for men 6/8 and for women from 12/8 to 14/8.

6. The counter should be narrow enough to fit the heel snugly and the vamp should lace rather firmly over the instep.

7. The shank should be rather broad and carry a steel built-in support from the heel to the bend of the sole at the metatarsal area to provide rigidity.

Such a shoe should be worn during the working hours of the day but may be replaced by a more pleasing and lighter shoe for dress occasions and evening wear.

The proper shoe having been fitted, the next step is the insertion into the shoe of the correct type of support needed to overcome the faults of balance present. It must be borne in mind that the most important element in this part of the treatment is that each foot is a problem in itself and that, while the basic principles of support are the same in all cases, the support must be varied to fit the needs of each particular foot under treatment. The type of support that I have found most satisfactory is made of sponge rubber of a fairly firm consistency. These supports are molded in various sizes and are composed of two principal parts, the longitudinal arch support and the anterior arch support.

Fig. 9.—Imprint of inlay on ball of foot, acting as guide for adjustment.

The longitudinal portion of the arch is some three-eighths inch thick on the inner side and is beveled to a feather edge on the outside and to the rear, the bevel running forward to meet the anterior arch portion. This component part of the support fits under the longitudinal arch of the foot, tending to hold the bones of this arch in place, take the strain off the plantar fascia, and by its thrust on the inner side of the os calcis roll the foot outward and overcome pronation.

The anterior section of the inlay is rounded in shape and some three-sixteenths inch to one-fourth inch in height and is beveled abruptly forward; backward it tapers to meet the longitudinal portion, allowing a depression in which the first metatarsal rests as it crosses the support. This part of the inlay fits up under the anterior arch just behind the heads of the second, third and fourth metatarsals, the heads of the first and fifth falling on the medial and lateral sides of the support. The inlay in this position tends to elevate the metatarsal arch into the normal posture.

A rubber inlay of this type may be fashioned readily and skived to give the support necessary for correction as determined for each patient. For the altering and shaping of the inlay, scissors or a shoe cobbler's knife may be used to trim the support to the correct size and shape. The inlay is then skived and smoothed into its proper contour over a small, coarse, motor-driven emery wheel.

In the flat or pronated type of foot the principal correction should aim at overcoming the pronation by tilt-

ing the foot outward and supporting the longitudinal arch. The highest elevation of the medial side of the inlay should be beneath the neck and head of the astragalus, but the elevation should extend well toward the heel before sloping down, so that a definite thrust against the sustentaculum tali is secured. This is most important if a true outward rotation of the foot is to result. The anterior part of the support properly shaped takes care of any depression of the metatarsal arch present.

If a bunion or hallus valgus is present, the inner side of the transverse arch portion should be beveled off under the great toe joint and skived low just behind this area—that part on which the first metatarsal rests—to avoid pressure on the bunion.

In extreme cases of flat foot in which the arches are markedly depressed it is advisable to begin with a rather low inlay and gradually raise the longitudinal arch

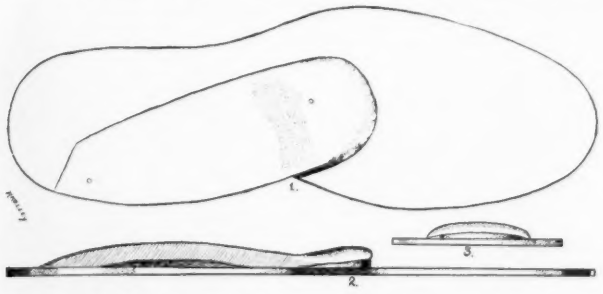

Fig. 10.—Method of raising long or anterior arch of inlay by the addition of thin wedges of felt or sponge rubber.

portion as the foot becomes accustomed to the new position and the pressure of the support.

In the high arched type of foot the inlay should be of moderate thickness under the central portion of the longitudinal arch but be well skived out under the heel or cut off level with the anterior margin of the os calcis. In this type of foot there is little or no pronation, and therefore the foot must not be tilted outward but the high longitudinal portion of the inlay used only to take

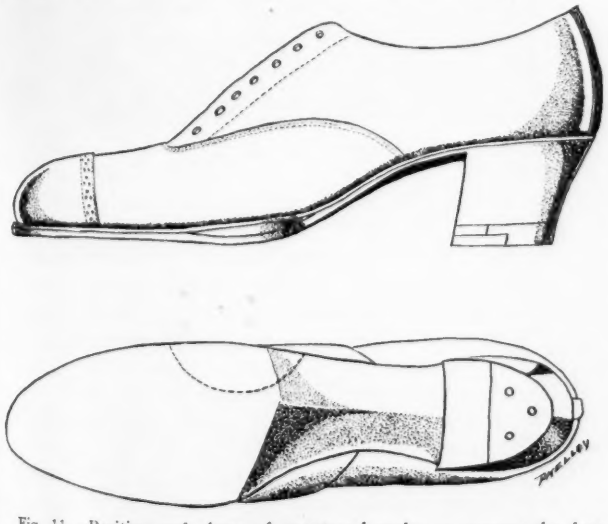

Fig. 11.—Position and shape of metatarsal wedge to prevent the foot from rolling to the outer side of the shoe.

strain off of the plantar fascia and the longitudinal arch of the foot. The anterior portion of the support should be fairly high and carried as far forward as is possible with comfort, as in this type of foot the strain falls principally on the metatarsal arch.

The support, having been fashioned, is then fitted to the sole of the foot and, if found correct, is ready for insertion into the shoe. Measurements are now made with an ordinary carpenter's caliper; the distance from the back of the heel to the head of the second meta-

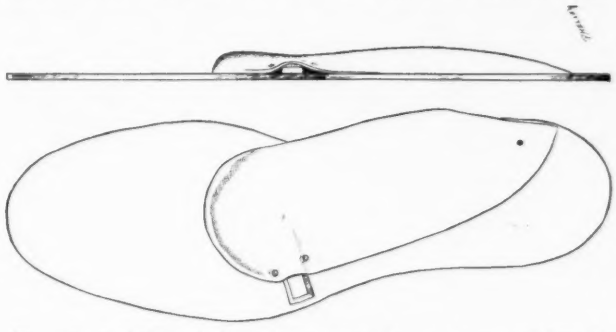

Fig. 12.—Position and shape of metatarsal bar to relieve metatarsalgia and prevent the ball of the foot from rolling to the outer side of the shoe.

tarsal bone is noted, pressure being made on the ball of the foot to tense the plantar structures. This measurement gives the approximate position of the anterior margin of the inlay from the back part of the heel on the insole. The medial or heavy side of the inlay is inserted flush against the inner margin of the insole and against the upper or counter of the shoe. After the inlay has been secured on the insole by two or three small tacks, the support is covered with a thin piece of leather or leather substitute, or the original sock lining of the shoe may be used.

The patient is now allowed to walk in the shoes and give the supports a temporary trial. If they seem

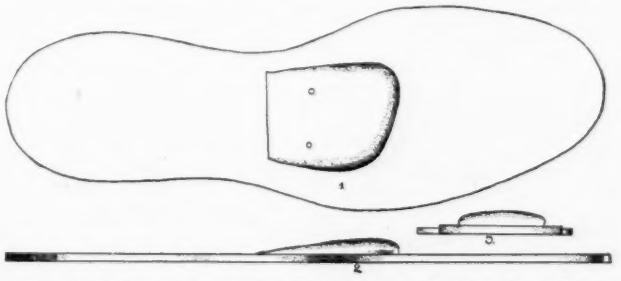

Fig. 13.—Shape, contour and placement of anterior heel: 1, position on insole; 2, lateral view; 3, anterior view.

comfortable the shoes are worn for two or three days, when the patient returns for further adjustment of the inlays. At subsequent visits when the shoes are removed it will be found on examining the sole that the imprint of the inlay is visible under the ball of the foot; this impression of the anterior portion of the inlay will act as a guide for future adjustments. The imprint of the anterior portion of the inlay should be evident between the heads of the first and fifth metatarsal bones and just behind the second, third and fourth metatarsal heads. It may also be found that too much pressure is being exerted by the support, in either the anterior or the longitudinal portion, in which case the inlay is removed and skived down to give the proper support. If sufficient support is not being given in any particular area, which will be judged by a nonrelief of the pain complained of, the support can be elevated on the under side by the addition of small wedges of felt or sponge rubber, which are glued into place. When the support is comfortable to the patient and complete relief is secured, the exact shape and contour with the

various measurements are noted on the permanent record.

As the foot is tilted outward to overcome the pronated position, it may be found that the forepart of the foot is shifting to the outer side of the shoe and the

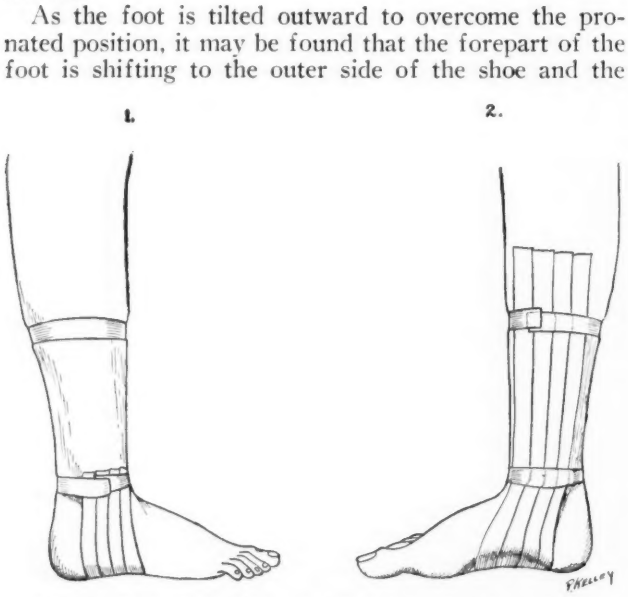

Fig. 14.—Type of strapping to support the long arch of the foot.

lateral aspect of the fifth metatarsophalangeal joint is becoming irritated. In such a case a metatarsal wedge or dutchman of one-eighth inch thickness should be inserted on the outer side of the sole of the shoe, just beneath the head of the fifth metatarsal. This elevation will overcome the outward sliding of the forepart of the foot and will in addition add to the efficiency of

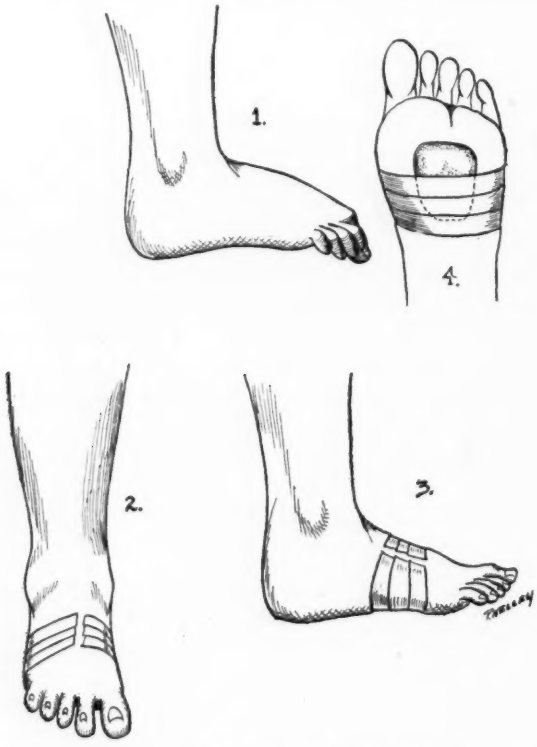

Fig. 15.—Type of strapping to support anterior arch of foot: 1, position of foot and toes for strapping; 2 and 3, views of strapping; 4, soft felt anterior heel can be incorporated in strapping for support.

the support under the longitudinal arch, as pointed out by Steindler.

In extreme cases of flat foot it may be found necessary to wedge the heel on the inner side or to extend the heel forward on the medial side, as advocated by Thomas.

When a pump or high heel type of shoe is substituted for dress wear, only the anterior portion (anterior heel) of the support should be used; this usually gives sufficient support for a time and makes it possible to wear such a shoe for short periods when the patient is not going to be on the feet continuously.

Strapping of the feet should be used only as a temporary measure to relieve pain in acute cases. In the flat foot type of imbalance, in which the pain is localized in the long arch or in the midtarsal region, the strapping should aim at supporting the long arch (fig. 14).

In acute cases of anterior metatarsalgia, a temporary strapping of the anterior arch will aid in giving relief (fig. 15).

FOOT EXERCISES

Supports, shoes, braces and strapping may hold the foot in the corrected position and relieve pain and discomfort, but such measures must be considered as only

Fig. 16.—Exercise 1.

passive agents. One must add to these measures others of an active character, which will build up and restore tone to the muscles and ligaments, which are the true and natural supports of both the longitudinal and transverse arches. This building up can be accomplished only by exercises carefully planned and conscientiously executed.

The following exercises are designed to strengthen the various muscle groups the function of which is to give support and elasticity to the feet. The exercises should be carried out twice daily, preferably morning and evening, and of course always in the bare feet:

EXERCISE 1.—*Toe gripping exercise.* This exercise develops the musculature that supports the metatarsal arch of the foot.

Position: Sitting, with several marbles or jackstones on the floor.

Action: Grasp the marble or jackstone with the toes and pick it up, placing it a foot or so from its original position. Now replace the marbles to their original position with the other foot.

EXERCISE 2.—*Foot adduction exercise* (walking). This exercise stretches the muscles on the lateral side of the foot and strengthens the muscles on the medial side of the foot, which tends to hold the arches in the proper position. This is an excellent exercise to overcome "weak foot."

Position: Standing, ready to take a step. The foot is rolled to the outer side and the toes are forcibly flexed.

Fig. 17.—Exercise 2, lateral and front views.

Action: Take from twenty-five to fifty steps with the foot in this position. This position holds both the longitudinal arch and the metatarsal arch in their proper posture.

EXERCISE 3.—*Heel stretching exercise* (standing). This exercise stretches the heel tendon and strengthens the muscle groups that hold the arches in balance.

Position: Standing, facing and 3 or 4 feet from the wall. Toes are turned in and forcibly flexed and the body weight is rolled to the outer side of the foot.

Action: Lean on the wall with the arms straight, back rigid and head erect. Slowly flex the arms, keeping the back straight and the knees and hips extended and the heels firmly on the floor, until the head touches the wall, or as near as is possible, rolling the feet to the outer side. Hold this position for a few seconds, then slowly straighten the arms assuming the original position. Repeat this movement from ten to twenty times.

If you are doing this exercise properly you will feel the pull in the muscles on the back of the calf and thigh of the leg.

CONCLUSIONS

Foot imbalance is a very widespread and incapacitating health condition that is being cared for in a very inadequate manner, generally speaking. An adequate study of the needs of each case and a careful, painstaking and rational therapy will in the majority of instances result in complete or satisfactory relief. Failure to size up the situation properly or careless, slipshod methods of treatment cannot but result in failure, to the detriment of the patient and the reputation of the medical attendant. The methods here described have proved on the whole satisfactory and are presented not as an answer to the problem of foot imbalance but as a contribution to its management.

1600 Professional Building.

ABSTRACT OF DISCUSSION

DR. CARL E. BADGLEY, Ann Arbor, Mich.: I am not in accordance with Dr. Diveley's description of the two types of feet—the high-arched foot and the low-arched foot. It seems to me that the greatest difficulty is in the high-arched foot. I would add two other types seen associated with the high, bony, longitudinal arch, with marked pronation. As I understood Dr. Diveley, in cases of high-arched foot pronation does not occur. I have in mind two types, one described by Dr. Kidner, with the accessory scaphoid, and the other by Dr. Hoch, of the extremely relaxed foot. In my experience these two types of feet of the high-arched type give the most trouble. I have tried to correct this foot and found the foot plate during the growing period of the child most satisfactory. I utilized the Hoch operation for the relaxed foot and the Kidner operation for the scaphoid.

DR. THEODORE A. WILLIS, Cleveland: There is a controversy between two schools of treatment of flatfoot. On one side are the advocates of metal arches and rigid shank shoes and, on the other side, of the flexible arch and soft pads. Having been brought up in the school of rigid support, I have discarded its use and have been converted to the other side. The important thing in the treatment of flatfoot is the instruction of the patient in the proper use of his feet. One can help with shoes, but until the patient learns how to bear his weight, he isn't going to have permanent relief. Students of anatomy are taught to consider the foot as the movable terminus of a fixed leg. The anatomy textbooks state that the flexor hallucis longus flexes the great toe and the plantar reflexes the foot on the leg. When the foot is fixed, however, this muscle doesn't do anything to the toes. It pulls on the bone and joint pulleys at the ankle around which its tendon turns. The foot must be studied as a weight-bearing, fixed base for the propulsion of the body as a whole. The three muscles whose tendons lie behind the inner malleolus, the long plantar muscles on the inner side, are most important in the prevention and correction of flatfoot. Each serves a different function. Each has its individual action. The tibialis posterior presses the inner malleolus forward and pulls the navicular upward and backward. The flexor digitorum longus turns through a strong ligamentous tunnel on the inner side of the talus. When the forefoot is fixed, this muscle lifts forward, upward and outward, raising the arch of the foot. The flexor hallucis longus tendon turns behind the posterior border of the talus, pressing it forward, and then runs under the sustentaculum tali of the calcaneus, exerting an upward pull on this lever arm. It not only lifts the front end of the os calcis upward and outward but pulls the heel of the os calcis inward. Dr. Diveley's insole

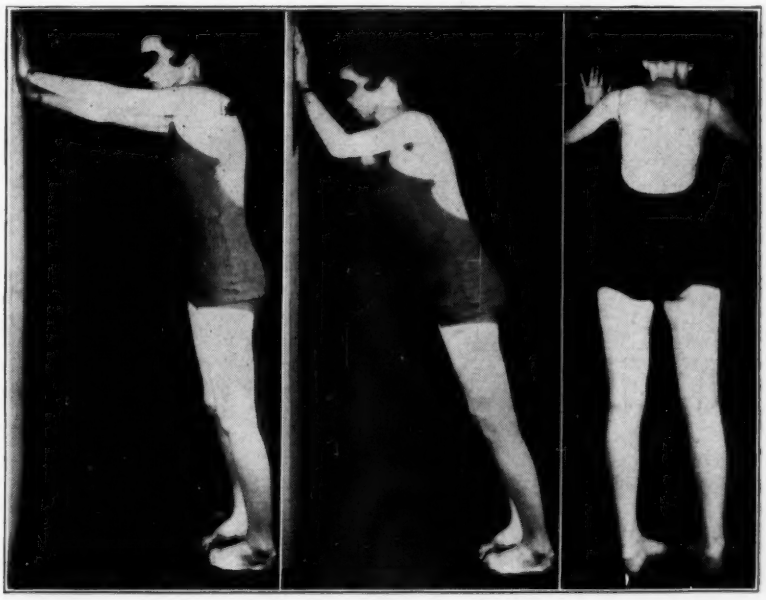

Fig. 18.—Exercise 3: first position, starting exercise; second position, completing exercise; at right, second position from behind.

tips the os calcis into a like position, but the patient must learn to do it habitually. A great deal is heard about tiptoe rising exercises for flatfoot. Tiptoe rising does nothing but develop the gastrocnemius. Exercises must be directed toward development of those particular muscles which are weak in the individual under treatment. Adhesive plaster strapping and the use of flexible supports are often of temporary benefit.

DR. LEWIS CLARK WAGNER, New York: The so-called flatfoot is easily treated but there is no one definite support that can be used by all patients. Muscle reeducation is most necessary. I feel somewhat against the use of steel plates, except for children. In dealing with the high arched foot with contraction of the plantar fascia and a cavus deformity, the treatment should be combined with surgery in extreme cases in order to restore the grasping power of the toes. Structural changes and deviation from the normal in the foot are often dependent on muscular imbalance, which leads to deformity and contraction of the toes with subsequent faulty weight bearing. This type of foot is characterized by a fairly high arch with loss of normal elasticity with or without a slight equinus due to contraction of the calf muscle. The etiology may be an inherited peculiarity but most likely the remnant of some disturbance of the cerebrospinal nervous system. A mild attack of poliomyelitis or some infectious disease of childhood or congenital syphilis can be the factor in the production of such conditions. When the deformity becomes extreme, the weight is thrown on the first metatarsal head and the great toe soon loses the grasping power in walking. Painful callosities develop on the dorsum of all the toes, but most severely on the first toe. Corresponding areas are found under the head of the first metatarsal bone. Inflammation and infection are often present. The accepted methods of treatment may be conservative (stretchings, tenotomies and foot plates) or directed to the removal of the deforming influences by transplanting the extensor tendons of the foot into the metatarsal heads with arthrodesis of the interphalangeal joints. When the extensor hallucis longus is transplanted to the metatarsal head, the elevation in the metatarsal bone is secured and normal grasping power of the great toe is returned, but dorsiflexion is lost, which makes walking difficult in the bare feet because of the dropped toe. By transplanting the extensor tendon of the fifth toe to the base of the first phalangeal joint, this difficulty can be obviated and a very satisfactory foot secured. The sesamoid bone of the great toe should be removed in extreme cases, as it will often be found distorted or inflamed because of the persistent trauma in its region.

DR. J. J. KURLANDER, Cleveland: A reasonably large number of cases of foot imbalance are due to a mild infantile paralysis that is unrecognized. I treat a considerable number of feet. In applying a plaster cast to the foot and leg for a fracture or other conditions I make it a practice to mold the cast under the arch and under the metatarsal head and in this way restore the proper foot alinement, often curing or relieving a foot condition that I did not know existed at the time. A painful foot may be an early manifestation of peripheral vascular disease; for that reason no foot examination is complete without palpating for the pulsation of the dorsalis pedis artery. An absence of pulsation is often the first sign of thrombo-angiitis obliterans. Many people have a condition which I call "chauffeurs' foot," from pressing down on the brakes or accelerator of their automobiles in such a manner that the toes are forced upward and the metatarsal heads downward. A simple way to relieve this painful condition is to instruct these patients to catch the pedals behind the heads of the metatarsals. This will force the heads up and the toes down. I do not use metal arch supports. I think the rigid arch should be reserved for acute arthritis. If the arthritis is so severe that one needs a rigid support, in all probability that patient ought to be entirely off his feet, instead of walking about. Flatfoot is due to two causes (besides paralysis): (1) overuse of the muscles, with resultant fatigue and relaxation, or (2) weakness of the muscles from too little use. In mild cases of "hollow foot," the metatarsal arch should be elevated by the use of a felt pad. But in severe cases, operative procedures, such as tenotomies or fasciotomy, may be necessary.

DR. REX L. DIVELEY, Kansas City, Mo.: Many have mentioned the successful use of the Whitman plate or other rigid metal arch supports, which are inserted in the shoe. I concur in the fact that this type of support has given excellent results; but the Whitman plate was devised for use when a rigid shank shoe was not obtainable. In using a flexible shank shoe, it is necessary to use some type of an inserted steel support; however, the majority of the shoe manufacturers are now building their shoes with a rigid shank; in other words, the steel support is built into the wide shank of the shoe. I have found it more satisfactory to use the rigid shank shoe, into which I insert the sponge rubber support, which is more easily fashioned and shaped and is much more comfortable to the patient and, I feel, is just as efficient as the Whitman plate. I agree that exercises are most important. It is my practice, however, to relieve patients of their pain by properly balancing the foot with shoes and supports, and then when relief has been obtained to build up the feet with proper foot exercises. It is interesting to note the attitude of the average orthopedic surgeon toward simple foot imbalance. Last week while attending the meeting of the American Orthopedic Association I asked three representative surgeons how they treated foot imbalance. The first replied: "About the only feet I see are of women with acute metatarsalgia and I manipulate and massage these feet once and generally never see them again. They are cured." The second man said: "We don't have very much foot trouble in our part of the country, so I do not pay very much attention to that aspect of orthopedics." The third one replied: "We have very little difficulty with foot conditions, although we see quite a number. We have an excellent brace maker and I just turn the patient over to him. He knows what they need and I do not bother with them again." Considering these three typical replies, one may draw the conclusion that the treatment of simple foot imbalance is a forgotten or neglected art with most orthopedic surgeons.

ELECTROCOAGULATION OF CERVICAL EROSIONS AND ENDOCERVICITIS IN THE LATE PUERPERIUM

A STUDY OF FOLLOW-UP RESULTS IN A SERIES OF PATIENTS DELIVERED AT THE WOMAN'S HOSPITAL

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Junior Attending Surgeon, Woman's Hospital
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It is our practice in the obstetric service of the Woman's Hospital to inspect the cervix at the end of the third stage of labor. If lacerations of 1 cm. or more are found, they are immediately sutured unless there are contraindications such as shock or infection. Patients are observed in the follow-up clinic for a period of from eight to sixteen weeks following delivery. This follow up has shown an unsatisfactory condition of the cervix in about one half of these women.

Trauma of some degree exists in practically all cervices after delivery, and it is well known that many cervices are the seat of chronic inflammatory conditions which antedate the first pregnancy. A careful study of the cervix at the sixth week post partum shows a good involution and healing in about one half of the patients. If lacerations and erosions are unhealed at the end of the eighth week, the condition tends to become chronic with an increased growth of the glandular epithelium, secondary infection, cervicitis and endocervicitis. These conditions are frequently responsible for persistent leukorrhea, pelvic pain and sacral

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backache along the course of the sacral lymphatics and nerves as well as for many cases of menstrual irregularity and menorrhagia due to faulty postpartal involution of the uterus.

It is the belief of many well known gynecologists that unhealed cervical lacerations, chronic cervicitis and

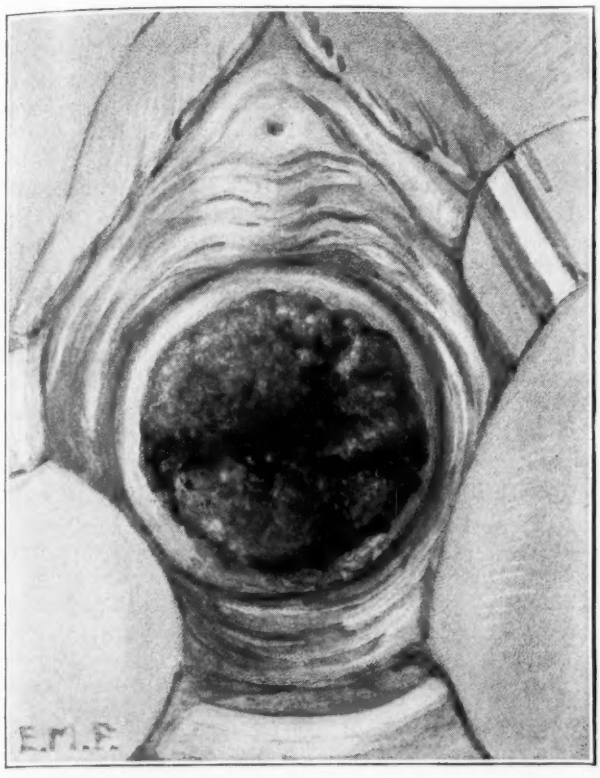

Fig. 1 (case 1).—Laceration and extensive erosion of the cervix in a primipara, before treatment, eight weeks post partum. From life drawing.

endocervicitis, with their subsequent structural changes, furnish a favorable site for the future development of cancer.

Crossen [1] is of the opinion that it is a well established fact that cancer of the cervix comes from long continued irritation in the form of endocervicitis, usually accompanied by lacerations, erosions and cystic changes. Great pains are taken to detect the first signs of cancer so that treatment can be promptly instituted, whereas a far safer plan is to remove the chronic cervicitis early before it becomes a cancer. An important step in preventing cancer is early removal of the chronic lesions of the cervix which precede the cancer. This seems to be the only means by which a further marked reduction in the deaths from this disease can be secured. It is dangerous to allow irritation in the cervix to persist even during the child-bearing period.

Pemberton [2] cites 1,087 cases in which repair of the cervix was done. Cancer developed in from five to thirty-six years in only twenty-three of this group.

Norris [3] mentions 1,247 patients treated for chronic cervical erosions in only one of whom cancer of the cervix was known to have developed.

H. A. Miller and his associates [4] state that to their knowledge no case of cancer of the cervix has occurred in which they had made a postpuerperal note to the effect that the cervix was healed.

E. Starr Judd [5] and C. Jeff Miller,[6] in articles dealing with this subject, concur in these opinions. Miller states that there is no doubt that endocervicitis is a condition to which that much abused word "precancerous" may be truly applied.

Culbertson [7] and Eden have called attention to certain types of erosion showing extensive proliferation of cells, which clearly place the disease on the borderline of malignancy.

Matthews [8] has pointed out that it is but a step from the extreme cell proliferation with orderly arrangement, which occurs in marked cystic hyperplastic endocervicitis, to the disorderly arrangement with embryonal cells found in true malignancy. Postpartal care would seem to be as important as antepartal observation. Cervical lesions should be corrected soon after delivery; if neglected, they may later need radical treatment.

H. A. Miller [4] has shown that erosions of the cervix in varying degree are present in 80 per cent of multiparas and in 10 per cent of primiparas. Culture of the cervices in more than 10 per cent of these women yielded streptococci. To assist in preventing the sequelae of lacerations and erosions, and as a prophylactic against infection in subsequent pregnancies, he advocates the early correction of the diseased condition of the cervix.

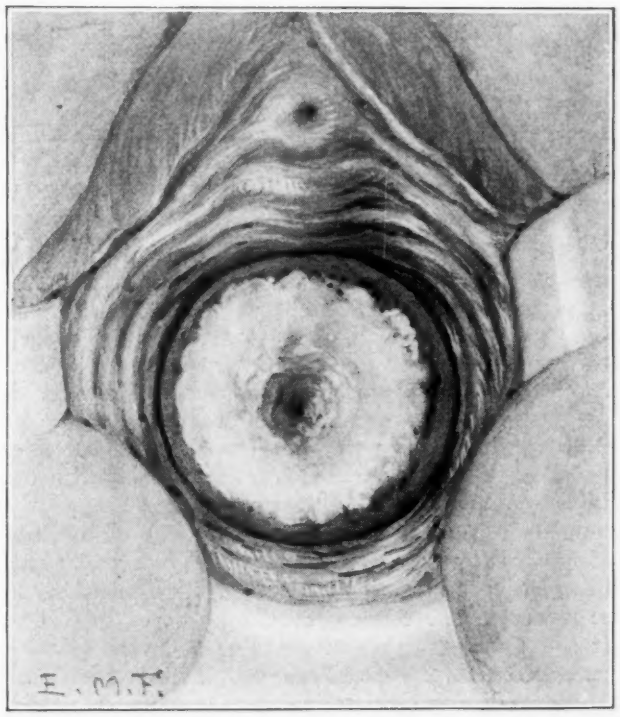

Fig. 2 (case 1).—Appearance immediately after electrocoagulation of the cervix, showing the white coagulum. From life drawing.

Goodall [9] believes that a previously damaged and infected cervix that has not been cleared up is a fre-

1. Crossen, H. S.: Am. J. Obst. & Gynec. **26:** 686-695 (Nov.) 1933.
2. Pemberton, F. A., in discussion on Crossen.[1]
3. Norris, C. C., in discussion on Crossen.[1]
4. Miller, H. A.; Martinez, D. B., and Hodgdon, M. E.: Prophylaxis of Puerperal Sepsis, J. A. M. A. **95:** 923-925 (Sept. 27) 1930.
5. Judd, E. S.: Surgical Treatment of Cancer, J. A. M. A. **84:** 10-13 (Jan. 3) 1925.
6. Miller, C. J.: Surg., Gynec. & Obst. **46:** 337-340 (March) 1928.
7. Culbertson, Carey: Erosion of the Cervix Uteri with Observations on Its Causes, Development and Results, J. A. M. A. **87:** 1808 (Nov. 27) 1926.
8. Matthews, H. B.: Electric Cautery Versus Sturmdorf Operation in Treatment of Chronic Endocervicitis, J. A. M. A. **87:** 1802 (Nov. 27) 1926.
9. Goodall, J. R., and Wiseman, M.: Am. J. Obst. & Gynec. **16:** 339 (Sept.) 1928.

quent source of pelvic thrombophlebitis in subsequent pregnancies.

Brown [10] and Baker [11] stress the importance of chronic cervical infection as a starting point for puerperal sepsis and as a focus for systemic toxemia.

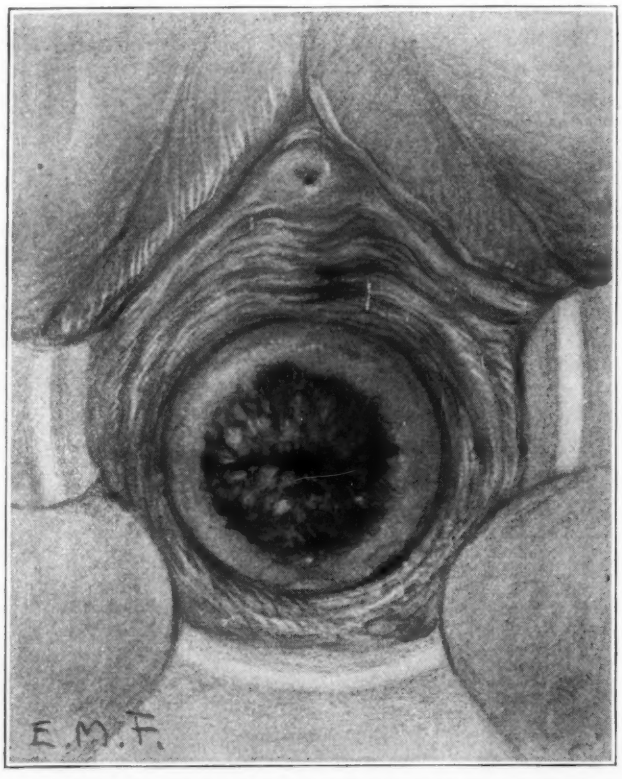

Fig. 3 (case 1).—Four weeks after electrocoagulation. The coagulum has completely separated, with shrinkage of the cervix. Islands of epithelialization are noted. From life drawing.

At the Woman's Hospital it was decided to treat a series of patients with damaged cervices during the late puerperium. The method chosen was electrocoagulation. By its use heat is generated within the tissues, penetrating deeply enough to destroy the diseased tissue and to cause instantaneous thrombosis and so prevent hemorrhage. Electrocoagulation produces a complete cellular necrosis. Ground [12] has proved that the sterilizing effect of the heat extends much farther than the visible coagulation; thus, there is a zone around the coagulated area that is lethal to micro-organisms, and yet the heat is not sufficient to destroy normal tissue cells. Electrocoagulation is unaffected by quenching in the mucus of the cervical canal and is not subject to the self limiting action of charring and carbonization that occurs with the actual cautery. This carbonization prevents uniform penetration and destruction of diseased tissue, and there is a far greater tendency to primary or secondary hemorrhage when the slough separates.

The cervix has been coagulated in a series of 120 patients who have been followed at least three months since the completion of treatment. We have treated all the cervices by a uniform technic using an electrosurgical diathermy machine operating on a frequency of about one million cycles a second with a corresponding wavelength of 300 meters. The voltage is low and variable; it is never more than 400 volts with any setting of this machine, the usual setting registering about 110 volts. The milliamperage used in coagulation is from 400 to 600 milliamperes.

The active electrode is an ordinary ball coagulating tip, the inactive electrode being a woven mesh strip placed about the patient's thigh. In the removal of polyps and for biopsy purposes a wire loop has replaced the ball electrode. This machine has an entirely separated patient's current, which is only inductively coupled to the oscillating current. It is therefore safe for the patient under all circumstances, because there is no direct connection between the patient's current and the electric mains.

Ende [13] has shown that there must always be a variable factor, owing to the variation in resistance of the individual patient, caused by such factors as size and tissue density. Measurement of the individual tissue resistance is possible but not practicable, because of the technical apparatus and the time consumed.

All treatments were carried out under local anesthesia of 2 per cent nupercaine applied topically on cotton pledgets. This has given very satisfactory local anesthesia, although when the coagulation is carried out high in the canal there may be some complaint of uterine cramps. In the cases requiring coagulation high in the canal, it is advisable that a wide dilatation of the cervix should first be done.

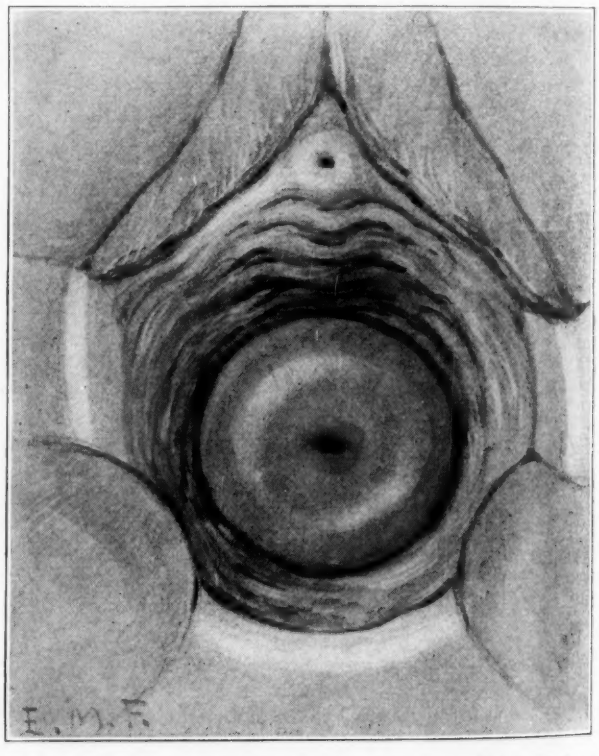

Fig. 4 (case 1).—Six weeks after electrocoagulation. The cervix has a normal appearance. From life drawing.

The coagulation is easily and quickly accomplished by a sweeping motion over the entire diseased area producing a white or grayish coagulum, carbonization,

10. Brown, G. V.: South. M. J. **24**: 122-126 (Feb.) 1931. Moench, G. L., and Schulman, A.: M. J. & Rec. **131**: 131-133 (Feb. 5) 1930. Harriman, W. F.: Am. J. Obst. & Gynec. **18**: 250 (Aug.) 1929.

11. Baker, H. W., and Miles, G. S.: Am. J. Obst. & Gynec. **19**: 548-549 (April) 1930.

12. Ground, W. E.: Wisconsin M. J. **30**: 722-726 (Sept.) 1931.

13. Ende, F. M.: Am. J. Obst. & Gynec. **18**: 72-80 (July) 1929.

indicated by excessive sparking, being avoided at all times. Experience has taught that the best results are obtained by light rather than deep coagulation, the penetration being, as a rule, from 2 to 5 mm.

The first seven to fourteen days following coagulation there is a free leukorrhea, often blood tinged. This persists until the coagulum has separated, after which there is rapid healing, usually complete in from four to six weeks. By the fifth or sixth week it has been found that the cervix has shrunk to normal dimensions, lacerations are healed and all eroded surfaces are completely epithelialized.

TABLE 1.—*Extent of Laceration*

	No. of Cases	Percentage
No laceration	4	3.3
Slight	21	17.5
Moderate	61	50.8
Extensive	34	28.3
Total	120	

TABLE 2.—*Type of Laceration*

	No. of Cases	Percentage
Unilateral	4	3.3
Bilateral	68	56.6
Stellate	44	36.6
Total	116	

TABLE 3.—*Degree of Erosion*

	No. of Cases	Percentage
Slight	11	9.1
Moderate (1-2 cm.)	92	76.6
Extensive (over 2 cm.)	17	14.1
Total	120	

TABLE 4.—*Endocervicitis*

	No. of Cases	Percentage
Mild	60	50.8
Moderate	31	25.8
Extensive	28	23.3
Total	119	

TABLE 5.—*Symptoms and Signs*

	No. of Cases	Percentage
Leukorrhea	112	93.3
Metrorrhagia	5	4.1
Hypertrophied cervices	50	41.6
Subinvolution	20	16.6
Pelvic pain	8	15.0
Total	195	

TABLE 6.—*Extent of Electrocoagulation*

	No. of Cases	Percentage
Surface and lower third of canal	37	30.8
Surface to middle of canal	46	38.3
Surface and high in canal	37	30.8
Biopsies	5	4.1
Total	125	

Of the 120 patients in this series, ninety were from the clinic service and thirty from private practice. Eighty-one were primiparas and thirty-nine multiparas. A second coagulation was done in only two patients in the group. Three of the patients in the group had had primary repair of the cervix at the time of delivery. All these women showed lacerations, erosions and endocervicitis of varying degree. Only two patients in this series had postoperative bleeding requiring packing, one on the eighth day and one on the fourteenth day. Healing in these two patients was not delayed in any way.

Histologic sections from cervices following electrocoagulation have been reported by Royston,[14] Kimble[15] and Hyams.[16] These authors agree that healing takes place without scar formation and that the healed surface is covered by normal squamous stratified epithelium.

The accompanying tables summarize the extent of cervical damage together with the chief signs and symptoms exhibited by this group of 120 patients.

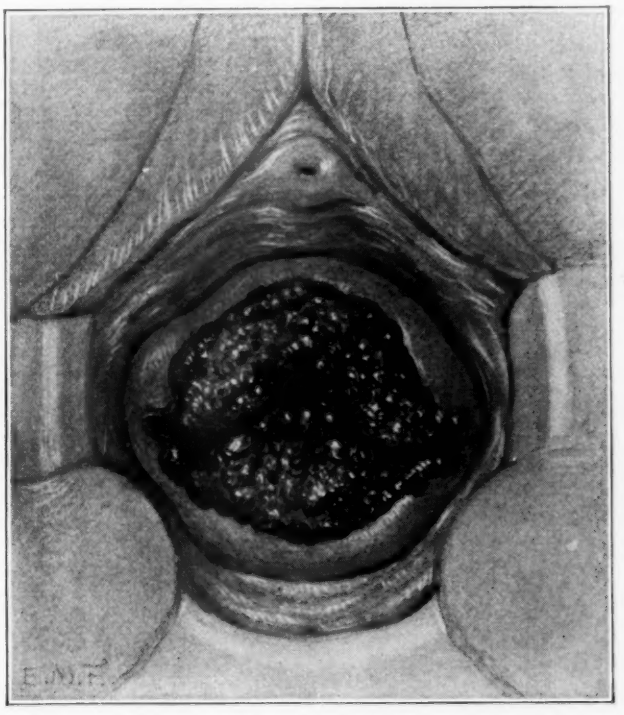

Fig. 5 (case 2).—Extensive stellate laceration, erosion and endocervicitis in a multipara eight weeks post partum. From life drawing.

All the 120 patients have completed at least three menstrual periods since the treatment. In no case is there evidence of cervical stenosis. Four patients of the private group have been delivered by the vaginal route without cervical dystocia. Four patients are now pregnant from two to six months. Two patients in the clinic group were treated by electrocoagulation while in the early weeks of an unrecognized pregnancy. The pregnancy was undisturbed. There are three women of the group of 120 who still complain of leukorrhea. Two of these patients suffer from Trichomonas vaginalis vaginitis and in the third patient the cause of the leukorrhea has not as yet been determined.

14. Royston, G. D., and Roblee, M. A.: Am. J. Obst. & Gynec. **24:** 381 (Sept.) 1932.
15. Kimble, H. E.: Arch. Phys. Therapy **14:** 550-553 (Sept.) 1933.
16. Hyams, M. N.: Arch. Phys. Therapy **11:** 171-178 (April) 1930.

All patients in this series were carefully selected to exclude any pelvic inflammatory disease. It is perhaps due to this careful selection that there was no lighting up of pelvic inflammatory reaction following coagulation.

In this group of 120 patients there are no unhealed cervices and no gross pathologic conditions are evident.

SUMMARY

1. A careful study at the eighth week post partum showed unhealed cervical damage in at least 50 per cent of all women in our series.

2. Unhealed cervical lacerations and erosions favor the future development of chronic cervicitis, endocervicitis and hypertrophy.

3. Chronic cervicitis and endocervicitis with the subsequent structural changes make the cervix a favorable site for the future development of cancer.

4. A chronically infected cervix is a possible source of thrombophlebitis and general sepsis in subsequent pregnancies.

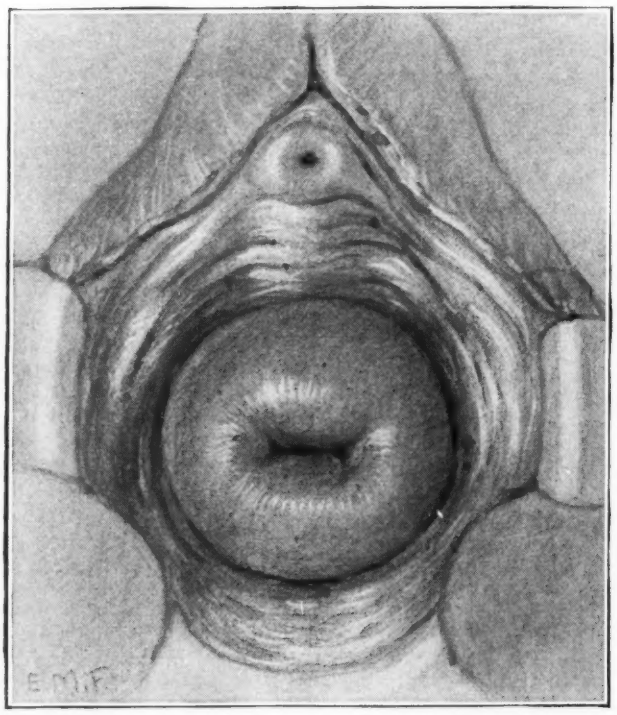

Fig. 6 (case 2).—Condition of cervix six weeks after electrocoagulation. From life drawing.

5. Cervical lacerations and erosions may be corrected safely and easily in the late puerperium by electrocoagulation.

6. Electrocoagulation, owing to its uniform penetration and destruction of diseased tissue without carbonization, is superior to cauterization in the treatment of cervical injuries in the late puerperium.

7. Healing, following electrocoagulation of the cervix, results in a smooth pliable epithelialized surface free from scar formation.

8. In a series of 120 patients, no stenosis of the cervix has occurred following electrocoagulation in the late puerperium.

9. All patients in this series were treated in the office or outpatient department. There are no unhealed cervices and no gross pathologic changes are evident.

59 East Fifty-Fourth Street.

ABSTRACT OF DISCUSSION

DR. JOSEPH B. DE LEE, Chicago: Those who saw my motion picture of forceps and episiotomy on the screen yesterday will note that there was very little laceration visible to the eye. On the left side there was a tiny mucous split but, as I said, the mucosa was intact. Magnified on the screen it impressed one, but in actual life it wasn't more than an eighth of an inch in extent and possibly a sixteenth of an inch deep. But the mucosa being intact does not mean that the cervical wall muscle was intact. It wasn't. It was torn on both sides submucosally and the muscle tissue had separated and then was so thin that one could have squeezed it together to the thickness of ordinary paper. The head, in coming down after that cervix was dilated, pushed the mucosa of the endocervical region ahead of it and everted it, very much like the anus of a horse after defecation. Nature does not always pull that mucosa back into the cervix, and this is really not a laceration. It is an overdistention of the cervix. I think one ought to distinguish between actual overdistentions and destruction of the muscle submucosally, from an actual bilateral laceration. It is almost impossible to sew up such a submucous laceration. The treatment shown by Dr. Barrett is possibly the best method at present of restoring a condition of that kind to the natural.

DR. A. H. CURTIS, Chicago: I wish to bring out one point: Either correction of an important lesion of the cervix may be made with the method that has been presented, which is very efficacious, or the very extensively diseased cervix may be removed surgically. There has been a tendency, when one encounters a markedly diseased cervix suspected of harboring a cancer or in which one fears the development of a cancer, to remove a fragment or two for histologic study. In those cases in which one is morally certain that there is no malignant condition but in which a biopsy is made for the sake of safety, I believe the entire lesion should be removed. Then safety has been secured not only for that moment but for several years following; otherwise the patient will have to be kept under constant surveillance.

DR. RALPH L. BARRETT, New York: This was a carefully selected group of cases treated in the late puerperium. It was not intended to treat all cases of endocervicitis. This was a trial to see what could be done with electrocoagulation in the late puerperium. The cases were carefully selected, extensive cystic and hypertrophied cervices were excluded. I attempted to cure those lesions which I thought had been produced by the recent pregnancy and labor. The pictures that the artist drew of these patients from life at the time of treatment and in subsequent weeks would seem to indicate that this simple procedure has corrected a large number of lesions. Very few of these cervical lesions were extensive. When biopsy was taken, an electrosurgical diathermy loop was used to obtain as much material as possible. No malignant changes were found.

DR. DE LEE: How deep do you think that slough was: how many millimeters?

DR. BARRETT: From 2 to 5 mm. as well as I could measure. I have no microscopic section made at the time.

Nature of Hodgkin's Disease.—The most important views as to the nature of Hodgkin's disease are that it is either: (1) an infection of unknown nature (lymphogranuloma) (German school, Longcope, MacCallum, Symmers, etc.); (2) an atypical form of tuberculosis (Sternberg, l'Esperance); (3) a lymphoblastoma (Mallory, Warthin); (4) a megakaryocytoma (Medlar); (5) a disease intermediate between infection and neoplasm (Lubarsch, Levin). The proper nosologic position of Hodgkin's disease is far from being, as some would have it, an almost wholly academic question. The direction of further study, with eventual practical matters of diagnostic and therapeutic importance, obviously are largely conditioned by one's attitude to such nosologic aspects. . . . While the nature of Hodgkin's disease remains obscure, the preponderance of evidence favors the infectious theory, with some promising support for its inclusion among the virus diseases.—Krumbhaar, E. B.: *Am. J. M. Sc.* **188**:597 (Nov.) 1934.

ARGYREMIA

DETECTION OF UNSUSPECTED AND OBSCURE ARGYRIA BY THE SPECTROGRAPHIC DEMONSTRATION OF HIGH BLOOD SILVER

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Assistant in Pediatrics, Johns Hopkins University School of Medicine
AND
T. NELSON CAREY, M.D.
Associate in Medicine, University of Maryland School of Medicine and College of Physicians and Surgeons
BALTIMORE

Argyria, the discoloration of skin or tissues caused by silver absorption, is considered extremely rare in modern medicine, but during the past few years it has reappeared with surprising frequency. The history of the subject, known also as argyrosis or argyrism, has been adequately reviewed by Gettler, Rhoads and Weiss [1] and by David.[2] According to its nature, argyria is designated as local or general; according to its origin it is occupational (professional) or therapeutic. The awakened interest in the subject is due to an increased occurrence of generalized argyria of therapeutic origin.

Many new cases have been caused by the intranasal and intra-oral administration of organic and inorganic silver compounds in colloidal form.[3] In these instances argyria has resulted not so much from treatment by the medical profession but from the lay practice of administering the preparations, particularly to children, as a daily routine for the prevention of colds. Other cases have developed during the silver arsphenamine treatment of syphilis.[4] Recently, Gernez [5] and others [6] have described a veritable epidemic of generalized argyria in northern France, caused by the prolonged administration of capsules containing collargol (a colloidal silver preparation) in treating pulmonary tuberculosis. From these considerations it is apparent that the untoward results of silver medication deserve attention; indeed, the comments of Knack [7] on the danger of internal silver therapy were echoed in THE JOURNAL not long ago.[8]

Thus far we have mentioned only comparatively new silver preparations and uses. In this summary must be included those cases produced, as were the classic cases of argyria, by the oral administration of silver nitrate in tabes, epilepsy and gastritis. Although this treatment has almost been abandoned, there are still occasional reports of argyria resulting from the use of silver nitrate in gastro-intestinal disorders.[7] These cases are a striking reminder that the practice lingers on, and it is with another instance of this kind that the present report deals, in which an unsuspected and obscure argyria is described that was detected by the demonstration of marked argyremia, or high blood silver, during a spectrographic examination of the blood.

REPORT OF CASE

A white woman, aged 33, admitted to the University Hospital, Oct. 30, 1933, complained of frontal and temporal headache, pain in the back, gastro-intestinal discomfort, weakness, and loss of weight.

The patient had a history of ill health since 1918. Her symptoms during this period were similar to those complained of by her mother, who had been "nervous" most of her life and who had been nursed by the patient for ten years. There was doubtful typhoid in the autumn of 1930.

In January 1932 the patient's gastro-intestinal symptoms became so severe that she was operated on, but no pathologic abdominal condition was found except a displaced right kidney, which was put into position at a later operation. In October 1932 most of the teeth were removed, after which she was in a semicomatose state for several months, with no evidence of postoperative sepsis. She recovered partially from this early in 1933 and from that time until admission remained in bed, complaining chiefly of pain on swallowing, constant abdominal pain, and headache. During this period her room was kept darkened. Loss of weight continued to a marked extent; the intake of food was very limited.

On admission the patient was extremely emaciated, with loss of practically all subcutaneous fat; she weighed only 72 pounds (32.7 Kg.). The skin was bound down tightly to the underlying structures, especially over the forearms, hands and feet. The skin was scaly; the hair was normal in quantity and distribution. A very peculiar ashen pallor was noted. The mucous membranes of the mouth were extremely pale and the teeth were absent, with the exception of the lower cuspids and incisors. The gingival portions of these teeth were coated with a dark calculus and were surrounded by moderate pyorrhea. In the gum margin about these teeth there was a very definite gray-blue pigmentation with a punctate distribution; this was in the gum itself and not due to the deposit on the teeth.

The extremities showed stiffening of most of the joints, especially in the wrists, fingers and ankles. The ankles were fixed in full extension. The neurologic examination was negative, and the extension of the feet was not thought to be due to muscular paralysis. The remainder of the examination was negative, except for the abdominal scars, emaciation and a marked apathy.

Laboratory reports were as follows: Urinalyses were consistently negative; blood and spinal fluid Wassermann tests were negative; gastric analysis showed the presence of hydrochloric acid. The average of several blood pictures showed hemoglobin 4.2 Gm., red blood cells 1,990,000, white blood cells 2,700, color index 0.9. The differential count was polymorphonuclears 22 per cent, polymorphonuclear eosinophils 4 per cent, small lymphocytes 52 per cent, and monocytes 22 per cent. No abnormal white cells were seen; there was a slight diffuse basophilia but no stippling. The picture suggested a secondary anemia, possibly aplastic.

Although no history of exposure to lead could be obtained and the blood picture was not characteristic, the possibility of lead poisoning was suggested by the gum line, by the anemia and, to a lesser degree, by the foot drop. Accordingly, a sample of blood was taken for spectrographic examination for lead. The results indicated only a faint, nonpathologic trace of lead, but during the examination comparatively heavy silver lines were observed.

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From the Department of Pediatrics of the School of Medicine, and the Biochemical Laboratory of the School of Hygiene and Public Health of the Johns Hopkins University, and the Department of Medicine, University of Maryland School of Medicine and College of Physicians and Surgeons.

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2. David, A.: L'argyrie généralisée d'origine thérapeutique, Bruxelles-méd. **12**: 1083 (July 24) 1932.

3. Royster, L. T.: Argyria: Report of a Case in a Patient Aged Five and a Half Years, J. Pediat. **1**: 736 (Dec.) 1932. Woodward, M. R.: Argyria from the Use of Colloidal Silver Iodide Intranasally, Am. J. Dis. Child. **45**: 1046 (May) 1933. Lundy, C. J.: Argyria Associated with a Heretofore Unreported Colloidal Silver Preparation, Illinois M. J. **63**: 173 (Feb.) 1933. Berkley, H. K.: Argyria: Report of Two Cases in Children, J. A. M. A. **102**: 202 (Jan. 20) 1934.

4. Becker, S. W., and Ritchie, E. B.: Argyria Following Excessive Use of Silver Arsphenamine, J. A. M. A. **97**: 389 (Aug. 8) 1931. Spiegel, Leo: A Discoloration of the Skin and Mucous Membranes Resembling Argyria, Following the Use of Bismuth and Silver Arsphenamine, Arch. Dermat. & Syph. **23**: 266 (Feb.) 1931. Cannon, A. B.: Value of Silver Arsphenamine in the Treatment of Early Syphilis: Conclusions Based on a Study of 104 Cases, J. A. M. A. **102**: 268 (Jan. 27) 1934.

5. Gernez, C.: Quatre cas d'argyrie généralisée chez des tuberculeux traités par une méthode thérapeutique à base d'argent colloïdal, Rev. de la tuberc. **13**: 433 (April) 1932.

6. (*a*) David.[2] (*b*) Gernez.[5] (*c*) Gernez, Houcke and Cuvelier: Sept cas d'argyrie généralisée, Ann. méd. lég. **12**: 251 (April) 1932. (*d*) Langeron, L.: Dellatre, A., and Paget, M.: Modifications histologiques et chimiques au cours de l'argyrie, Compt. rend. Soc. de biol. **114**: 132, 1933.

7. Knack, A. V.: Zur Gefahr der internen Silbertherapie, Deutsche med. Wchnschr. **58**: 1672 (Oct. 21) 1932.

8. Danger in Internal Administration of Silver Preparations, Current Comment, J. A. M. A. **100**: 1604 (May 20) 1933.

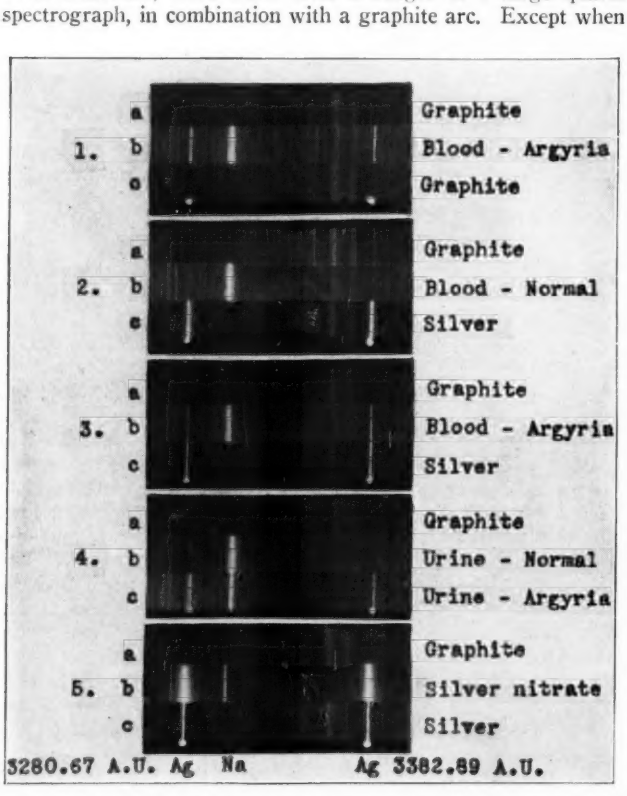
As a result of this, inquiry was made with respect to silver absorption and the possibility of argyria. It was found that for the entire preceding year the patient had been taking capsules containing silver nitrate for gastro-intestinal symptoms. Each capsule contained one-fourth grain (16 mg.) of silver nitrate, and they were taken three times a day for alternate periods of two weeks.

To the clinical impression of psychoneurosis and nutritional anemia, which were indicated by other studies, were added the diagnoses of early argyria as the cause of the gum line and peculiar pallor, and silver intoxication as a partial cause of the anemia and asthenia. As a complete summary of the clinical study of the patient is not important for this report, it is not included.

The diagnosis of argyria thus made was verified by further studies of the blood and several other body constituents.

SPECTROGRAPHIC ANALYSES

The spectrographic analyses of the blood, as well as of the other materials, were made with a Hilger E 1 large quartz spectrograph, in combination with a graphite arc. Except when



The dots mark the positions of the silver lines, the left one at 3,280.67 and the right one at 3,382.89 angstrom units. The heavy line between the two is in reality a pair of lines, caused by sodium. 1. In the first spectrogram, *a* is the control spectrum of the empty graphite electrodes; *b* is the spectrum of the blood ash from the case of argyria, taken two weeks after the end of silver absorption, and *c* is again the graphite. Notice that the silver reference lines are not photographed in *c*, because argyria was not suspected at the time. 2. *a*, graphite; *b*, normal blood ash, but with known silver salt for reference lines in *c*; note that the silver lines are practically absent in *b*. 3. *a*, graphite; *b*, argyria blood ash three months after end of absorption; note persistence of marked argyremia, as indicated by silver lines in *b*; *c*, silver. 4. *a*, graphite; *b*, normal urine ash; *c*, argyria urine ash; note presence of silver lines in *c*, showing elimination of silver three months after end of absorption. 5. *a*, graphite; *b*, silver nitrate capsule, illustrating the high content of silver; *c*, silver.

specified otherwise, the technic followed was similar to that used in the blood lead method described by Shipley, Scott and Blumberg.[9] This analysis requires the ash from 5 cc. of blood and may be completed within from twelve to twenty-four hours. The silver lines demonstrated were the two characteristic "raies ultimes," or most persistent lines, with wavelengths of 3,280.67 and 3,382.89 angstrom units.

Blood.—It is interesting that marked argyremia, or high blood silver, apparently has never before been reported in argyria. Particularly striking is the fact that Gernez and his co-workers,[6c] using a chemical method, did not even detect silver in the blood, either during or after collargol ingestion. In our case, on the other hand, it was by means of the high blood silver that the obscure argyria was recognized. Generalized argyria implies vascular transportation, and it is extremely unlikely that the metal is carried exclusively, if even appreciably, by the lymph. Consequently, silver must at some time be present in the blood, probably as the albuminate, chloride and silver ion, regardless of the form in which it is ingested.

In the spectrograms shown here it is seen that the silver lines are comparatively heavy in the blood of our patient, whereas they appear as very faint traces, or are absent, in normal controls. The spectrographic detection of traces of silver in normal blood has been reported.[10] By inspecting a series of more than 200 blood analyses, we found that faint traces of silver frequently occurred, especially in children. However, in some samples it could not be detected, so we cannot consider silver a normal constituent of blood on the basis of our analyses.

By means of standard spectrograms made by adding a known amount of silver nitrate to a silver-free blood, a quantitative estimation of blood silver was made possible. In terms of absolute sensitivity, as little as 0.000005 mg. (0.005 microgram) could be detected. With the ash method, the silver lines would appear at a concentration of 0.0005 mg. per hundred cubic centimeters. By comparison with the intensity of the silver lines in the standard spectrograms, the blood silver in the case of argyria was estimated to be 0.05 mg. per hundred cubic centimeters in the earliest sample, which had been taken two weeks after absorption had ended. This value is almost as high as the figures found for blood lead in lead poisoning.[11] During the actual time of absorption, the blood silver concentration must have been closer to 0.1 mg. per hundred cubic centimeters.

When a rapid liquid method was employed on an oxalated sample, silver could be detected in a single drop of the patient's blood. A micromethod in which 0.1 cc. of finger-tip blood was delivered directly onto a cored graphite electrode revealed silver quite definitely; in control samples, of course, the metal could not be detected. This may be used as a thirty minute method for detecting high blood silver in peripheral blood.

The distribution of the blood silver was determined from heparinized, oxalated and clotted samples. In our case of marked argyremia, as well as in the frequent normal traces, the major part of the silver resided in the plasma or serum. Since the heparinized cells still contained silver after two saline washings, it is probable that a minor part of the silver was truly adherent to the cell fraction.

In normal children we have found that the trace of silver does not appear consistently, and in some cases the occurrence has been roughly correlated with periods of administration of mild silver protein. Our patient, however, exhibited not only a marked but a persistent argyremia. The high blood silver was first detected two weeks after the silver ingestion had ceased. At the time of the last analysis, made three months after the end of exposure, the blood silver showed only a small decrease. This persistence of silver in the blood was not entirely unexpected, because it has been found that the blood lead remains high for many months following lead intoxication.[11] However, the duration and extent of the argyremia proved that the silver was consistently circulating and had not been detected during temporary transit. It appeared, therefore, that the patient's tissues contained a heavy deposit of the metal, part of which was still in a soluble form.

In order to learn more of the persistence of silver in the blood, samples were secured from three old cases of argyria in which the pigmentation had been present for more than ten years. The analyses showed only faint traces of the metal. This demonstrated the eventual departure of abnormal silver from the blood.

9. Shipley, P. G.; Scott, T. F. M., and Blumberg, Harold: The Spectrographic Detection of Lead in the Blood as an Aid to the Clinical Diagnosis of Plumbism, Bull. Johns Hopkins Hosp. **51:** 327 (Nov.) 1932.

10. Zbinden, C.: Recherches spectrographiques sur des cendres de sangs et d'organes humains, Mém. de la Soc. vaudoise des sciences naturelles **3:** 233 (July 15) 1930. Sheldon, J. H., and Ramage, Hugh: A Spectrographic Analysis of Human Tissues, Biochem. J. **25:** 1608 (No. 5) 1931.

11. Blumberg, Harold, and Scott, T. F. M.: The Spectrographic Determination of Lead in Blood, Tr. Soc. Pediat. Research, May 1, 1934; abstract to be published in the American Journal of Diseases of Children.

Urine.—Charcot [12] mentioned the excretion of silver through the kidney, but the observation had never been confirmed by modern analyses. Although Gernez and his co-workers [6c] detected silver in the bile, they were unable to find it in the urine, using chemical and spectrographic methods. In our case a high urinary silver was easily demonstrated, as shown in the accompanying illustration, even three months after the last ingestion of silver. In normal urines, as well as in the urine in an old case of argyria, the metal was detected in only faint traces or not at all. These results revealed a partial silver elimination, similar to the deleading following lead intoxication.

Feces.—The feces also showed high silver, although only faint traces were present in controls and in a sample from an old case of argyria. This demonstrated that the gastrointestinal tract also aided in silver elimination.

Cerebrospinal Fluid.—A moderate trace of silver was detected in the cerebrospinal fluid, whereas in controls it appeared in only very faint traces or not at all.

Saliva.—Saliva was secured after pilocarpine stimulation; obtained in this way, the sample was less likely to be contaminated by food débris. The result showed a definite trace of silver, while the metal was present as a very faint trace or was absent in controls. Although the conditions of sampling prevent a positive statement, it appears probable that silver was contained in the salivary secretion.

Skin.—Spectrographic demonstrations of silver have been reported in excised pieces of pigmented skin in argyria,[13] as well as in the hair and nails.[6c] As a result of a biopsy that had been made for suspected scleroderma, we had available a very small piece of undarkened abdominal skin. After a thorough rinsing in distilled water, the skin was dried and analyzed directly without ashing. Since there had been no contamination with silver in the pathology department, the detection of heavy traces of silver proved that there was a potential argyria in the absence of the dark pigmented forms of silver, which are probably the oxide, sulphide and metallic silver, in addition to some unknown form. Control skin analyses showed only a very faint trace of the metal.

Dental Tartar.—Lacking ethical justification for biopsy, we were unable to complete our story by identifying the pigment that started the investigation—the gingival "lead" line. However, the discoloration was also present on the lower teeth; so the deposits of dark tartar were removed for analysis. This material revealed heavy traces of silver, while a control sample showed only a doubtful trace.

AMOUNT OF SILVER INGESTED

It has been estimated that signs of argyria may appear after the absorption of only 2 Gm. of silver nitrate.[14] In our case, the capsule used was supposed to contain one-fourth grain of silver nitrate, and the dosage was one capsule, taken three times a day. By alternate administration for from two to three weeks, and withdrawal for two weeks, the treatment had been maintained for a year. The total ingestion, then, was approximately 10 Gm. of silver nitrate, which is equivalent to about 6.4 Gm. of silver. In comparison with the literature this figure is not high, yet it is much above the lowest amounts that may produce argyria.

COMMENT

An interesting feature of the case is that, despite the peculiar pallor, there was no obvious brown, blue, gray or black pigmentation other than the gingival lines and the nonspecific dental discoloration. The blue-gray "silver" gum line is considered an early sign of argyria, although it is absent in many cases. It might be that the generalized pigmentation would develop more clearly in the future, for Gernez [5] has commented on the retarded appearance of the discoloration.

Nevertheless, it is perhaps significant that the patient was not exposed to strong light during the period of silver treatment. Since the discoloration occurs chiefly in the exposed parts of the body, that is, the face and hands, it must be assumed that light may play a rôle in the pigment production. Furthermore, Zacks [15] has reported the sudden appearance of argyria after ultraviolet irradiation of a child who had received mild silver protein intranasally for a long time. We were unable to attempt prolonged irradiation of our patient for fear that the experiment would be successful. By reason of its fixative action on the silver in unpigmented skin, light would appear detrimental to the partial elimination of silver from the body. Consequently, patients who are developing argyria, or who are in danger of doing so, probably should avoid strong illumination for many months after silver absorption has ceased.

Except for the extremely undesirable pigmentation, no harmful effects of chronic silver absorption have been definitely established. Although anemia and asthenia, as well as digestive disturbances,[5] have been noted with suspicious frequency, there is as yet insufficient evidence to consider argyria a sign of true intoxication. In view of the hemolytic action of silver, however, it is probable that the effect of the metal contributed to the anemia and asthenia in our case.

The detection of this obscure case of argyria has provided an example of the value of spectrographic analysis in diagnosing suspected intoxications. In this case of argyria the gingival line was present; the demonstration of marked argyremia enabled us to discover the cause of the line and to differentiate the pigment from the confusing gum line of lead or bismuth. When the line is not present, the peculiar pallor of early argyria would be even more difficult to recognize. We suggest the spectrographic examination of blood for high and persistent silver content as a method of guarding against argyria during the use of silver arsphenamine, silver nitrate, mild silver protein, neosilvol and other silver preparations.

Finally, we wish to reiterate the word of warning in regard to the danger of internal silver therapy. Despite the possibility of sometimes decolorizing small areas of local argyria,[16] the pigmentation of generalized argyria is so extensive that it may be considered permanent and beyond remedy. The controlled use of certain preparations cannot be opposed, but there are some silver treatments that are not only inefficacious but even lack the merit of being harmless.

SUMMARY

1. The spectrographic demonstration of marked argyremia, or high blood silver, permitted the detection of an unsuspected and obscure case of argyria, resulting from the oral administration of silver nitrate for gastrointestinal symptoms.

2. The blood silver was estimated spectrographically to be 0.05 mg. per hundred cubic centimeters; in normal blood, silver appears as a very faint trace or is absent, i. e., to an amount less than 0.0005 mg. per hundred cubic centimeters.

3. The persistence of the high blood silver for more than three months after exposure indicated a heavy deposition of silver in the tissues.

12. Charcot, J. M.: Oeuvres complètes de J. M. Charcot, Paris **8**: 419, 1889.
13. Gernez.[5] Gerlach, Walther, and Gerlach, Werner: Der Elementnachweis im Gewebe: III. Mitteilung: Zur Frage der Argyrosen, insbesondere über den spectrographischen Silbernachweis in der Haut, Dermat. Wchnschr. **95**: 1497 (Oct. 15) 1932.
14. Koelsch, F.: Ueber gewerbliche totale Argyrie, München. med. Wchnschr. **59**: 304, 1912.
15. Zacks, M. A.: Argyria in a Child Following Intranasal Use of Argyrol, Laryngoscope **43**: 680 (Aug.) 1933.
16. Stillians, A. W., and Lawless, T. K.: The Intradermal Treatment of Argyria, J. A. M. A. **92**: 20 (Jan. 5) 1929.

4. Abnormally high silver was also detected in the urine, feces, cerebrospinal fluid, skin, dental tartar and probably saliva. The presence of the metal in the urine and feces demonstrated that silver was being partially eliminated from the body.

5. Only faint traces of silver were present in the blood and urine in definitely pigmented cases of argyria ten years or more after exposure; this showed the eventual departure of appreciable silver from the circulation.

6. The spectrographic determination of silver in the blood, skin and other parts of the body is an aid in diagnosing obscure argyria and in differentiating it from lead or bismuth intoxication.

7. The spectrographic determination of blood silver is suggested as a method of guarding against argyria in silver therapy.

8. A warning note is again sounded on the danger of internal silver therapy.

THE ORIGIN OF THE WHITE BLOOD CELLS

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Since 1870, when hematology was first established as a branch of scientific medicine by the discovery of cells in the blood stream,[1] the polemics of the problem concerning these circulating units have centered about their origin. Each decade has witnessed an increasing volume of research and an even greater variety of interpretation in an attempt to establish some concept of the histogenesis of these cells on a sound and unassailable foundation. While complete success in reaching this objective has in no sense been attained, it nevertheless is profitable to analyze, from time to time, certain fundamental aspects of the problem which seem to be influenced or clarified by recent contributions in this field. Therefore, while recognizing the difficulties inherent in the problem and the necessity of altering interpretations from time to time as additional new facts become apparent, the present discussion will seek to analyze critically some of the more important concepts, with special attention to clarification of ideas in two directions: first, an elucidation of the position and of the separate identity of the lymphocyte in hematopoiesis, and, second, the newer evidence for the establishment of the independent origin of the monocyte from the reticulo-endothelial system.

THE EXISTING THEORIES IN EXPLANATION OF HEMATOPOIESIS

The demonstration of the mechanism whereby the white blood cells are formed depends, as in all biologic phenomena, in part on adequate experimental data and in part on interpretation. Only when the experimental evidence is adequate both in quantity and in quality does it become possible to make interpretations and draw conclusions that are convincing. So far as the origin of the white blood cells is concerned, it may be said that the accrued mass of experimental fact has been adequate to convince the majority of hematologists on only three aspects of the problem: First, that the mother tissue for the formed elements of the blood is to be identified with a group of primitive cells designated by Aschoff and Kiyono [2] as the reticulo-endothelial system of fixed tissue cells. Second, that the cells of this structure by maturation and repeated division give rise to a generation of free cells with primitive nuclei and basophilic cytoplasm, which further divide and mature, thereby becoming ultimately the definitive cells of the circulating blood. Third, that the granulocytes and red blood cells exhibit different physical characteristics of the cytoplasm and nucleus, constituting maturative phenomena representative of a life cycle for each form. It may be added that the experimental data have not been adequate as yet to convince the majority of the investigators in this field on the following major points, which therefore have become highly controversial and subject to varying interpretations; first, that all cells of the reticulo-endothelial group are identical and therefore possess equal potentialities; second, that the free, primitive cell is identical with the blood lymphocyte and the latter is therefore always totipotential; third, that the life cycles of granulocyte and erythrocyte are reversible; fourth, that the monocyte is closely related to and probably identical with the clasmatocyte.

Chart 1 represents, by diagrammatic summarization, the principal theories held by the various proponents of the different schools of thought in explanation of the origin of the blood cells. The major points in conflict as well as those in agreement which were emphasized in the foregoing paragraph, are made quite evident by a study of this diagram. Extensive reviews [3] which detail the experimental data that have given birth to these varying interpretations are very complete and no useful purpose can be served by repeating them here. Certain crucial aspects of the problem that have been referred to previously, however, deserve, and will receive, further elaboration.

THE SO-CALLED RETICULO-ENDOTHELIAL SYSTEM

Early in embryonic life, the diffuse mesenchyme consists of fixed star shaped cells and free mobile elements. The fixed mesenchyme (the entoderm and the ectoderm are not concerned in blood formation at any time) becomes differentiated into two cell types with different prospective potencies; the collagen-producing spindle shaped elements become the fibroblasts of the adult tissues and probably lose all ability to reproduce cells other than themselves; the second type do not all differentiate but always there are some that retain embryonic characteristics throughout adult life. The latter elements are scattered throughout the loose connective tissue of the body and have been called resting wander-

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Owing to lack of space, this article is abbreviated as it appears here. The article in its entirety will appear in the author's reprints.

Read before the Section on Pathology and Physiology at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 14 1934.

1. Hewson, W.: Phil. Tr. **60**: 368, 1770; **63**: 303, 1773.

2. Aschoff, L., and Kiyono, K.: Folia haemat. **15**: 383, 1913.

3. These include:
(*a*) Marchand, F., Krehl and Marchand: Handb. d. allg. Path., Leipzig, S. Hirsel, 1924.
(*b*) Cunningham, R. S.; Sabin, Florence R., and Doan, C. A.: Pub. 361, Contributions to Embryology **16**: 125, 163, 227, 1925
(*c*) Doan, C. A.: J. Lab. & Clin. Med. **17**: 887 (June) 1932.
(*d*) Doan, C. A.: Medicine **10**: 323 (Sept.) 1931.
(*e*) Sabin, Florence R.: Physiol. Rev. **2**: 38 (Jan.) 1922.
(*f*) Bunting, C.: Physiol. Rev. **2**: 505, 1922.
(*g*) Maximow, A.: Physiol. Rev. **4**: 533 (Oct.) 1924.
(*h*) Maximow, A.: Special Cytology, edited by E. V. Cowdry, ed. 2, New York, Paul B. Hoeber, Inc., 1932, pp. 603 and 711.
(*i*) Naegeli, O.: Blutkrankheiten und Blutdiagnostik, ed. 4, Berlin, Julius Springer, 1923.
(*j*) Oberling, C.: Ann. d'anat. path. **1**: 87, 1924.
(*k*) Downey, Hal: The Occurrence and Significance of the "Myeloblast" under Normal and Pathologic Conditions, Arch. Int. Med. **33**: 301 (March) 1924.
(*l*) Downey, Hal: Folia haemat. **34**: 65 (June) 145 (Aug.) 1927.

ing cells,[4] macrophages,[5] and rhagiocrine cells,[6] and are described in the serous membranes [7] under the name of clasmatocytes. They are particularly prominent in the spleen, lymph nodes and bone marrow, where they form a syncytium, and are in close relationship to the endothelium of the venous sinuses of the spleen, bone marrow, and lymph channels of the lymph nodes. At this point differences in interpretation have arisen. These specialized endothelial cells have been thought to be, in fact, flattened reticular cells identical with the syncytial primitive mesenchyme [8] and therefore not true endothelial cells in the usual sense; others regard them as true representatives of endothelium,[9] which in the bone marrow, liver, spleen and lymph nodes retain the angioblastic characters of the endothelium of the blood islands [10] and therefore are embryologically distinct from and in no sense identical with the reticular cells.

The evidence for the identity of reticulum and endothelium, based on functional grounds, has been concerned largely with the reaction of these cells to vital dyes. On the introduction of vital staining, Ribbert [11] was able to show that the reticular and endothelial cells of the spleen, lymph nodes and bone marrow, the Kupffer cells of the liver and the reticular cells of the thymus and certain other tissues had the specific power to store lithium carmine. He noted that the general vascular endothelium took the dye either very faintly or not at all. However, the first investigator to formulate clearly the concept that these specialized endothelial cells were identical with the reticular cells was Goldmann,[12] who stained them intravitally with pyrrhol blue, called them the pyrrhol cells, and identified them with the clasmatocytes of Ranvier,[7] the rhagiocrine cells of Renaut,[6] the resting wandering cells of Maximow,[4] and the adventitial cells of Marchand.[13] Further interpretation was given by Aschoff and Kiyono [14] in 1913-1914, when reporting on the vital staining characteristics of these cells in normal and pathologic tissues and describing their reaction in health and disease. They interpreted the relationship between these cells as constituting a tissue the component parts of which function identically so far as their reactions to vital dyes and the production of new cells are concerned. They expressed and emphasized this concept by inventing the term "reticulo-endothelial apparatus" to cover this system of cells.

Although the similarity of the reticular and endothelial cells in their reaction to vital dyes is admitted, yet there are many reasons based also on functional grounds that deny their identity. Aschoff himself in a later publication [15] has noted that the reticulum and endothelial cells of the lymph nodes behave differently toward particulate matter in that the latter show much more activity than the former in storing these substances. Cunningham [16] found that the endothelium of the splenic sinuses and the reticulum cells of the pulp responded differently to injections of india ink in rabbits. Perhaps the strongest evidence for the dissociation of endothelium and reticulum has been presented by Doan,[10] who was able to follow the independent regenerative reactions initiated by reticulum cells and endothelium on the hypoplastic marrow of starving pigeons, when the stimulus of an adequate diet was restored. The varying reactions of these cells to tuberculophosphatide [17] and to other lipoid substances,[18] in monocytic leukemia [19] and in other pathologic states [20] furnish additional facts tending to warrant the dissociation of these two cells. Without further elaboration it seems certain from these facts that the common identity of the cells comprising the reticulo-endothelial system is extremely doubtful on embryologic, physiologic and pathologic grounds. The importance of establishing the accuracy of this concept is fundamental to all hypotheses bearing on the origin of the blood cells and forms one of the basic differences between the proponents of the monophyletic and polyphyletic schools.

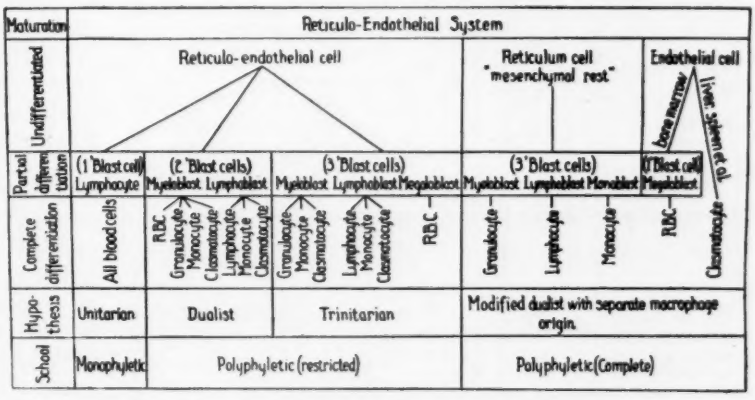

Chart 1.—This chart summarizes the principal points that are in conflict and in agreement between the various theories that have been advanced to explain the histogenesis of the blood cells. There are three levels of maturation that are common to all; in the first level primitive undifferentiated mesenchymal cells provide the blast cells of the second level, which in turn, by maturation and division, become the completely differentiated cells of the circulating blood, represented by the third level. The degree of polygenesis is determined by the number of partially differentiated (blast) cells that are believed to be necessary in order to render accordant the experimental facts and observations as interpreted by the various investigators which comprise the schools of thought shown in the lower portion of the chart. The principal difference, as indicated, is in the degree of prepotency ascribed to the blast cells, the unitarians feeling that a single common ancestor (the lymphocyte) may differentiate into any of the mature types of cells. Attributing lesser degrees of potentialities to this cell results in increasing degrees of polyphyletism, which in the extreme construction requires a separate blast cell for each of the circulating elements, and a separation of the reticulo-endothelial system of cells into its component units, each with different potentialities.

THE PROBLEM OF THE LYMPHOCYTE IN HEMATOPOIESIS

In all discussions involving the origin of the white blood cells, the rôle of the lymphocyte continues to occupy the central position about which all other concepts radiate. Lacking specific cytoplasmic substances that can easily be identified, such as granules, hemoglobin or vacuolar pattern, the separate existence of this cell type on a par with erythrocyte and granulocyte

4. Maximow, A.: Arch. f. mikr. Anat. **67**, 1906.
5. Evans, H.: Am. J. Physiol. **37**, 1915.
6. Renaut, J.: Arch. d'anat. micros. **9**: 495, 1907.
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8. Downey, Hal: Anat. Rec. **9**, 1915. Maximow (footnotes 3 *g* and 3 *h*). Foote, N. C.: Anat. Rec. **30**: 15, 1925.
9. Jolly, J.: Traité technique d'hématologie, Paris, A. Maloine et fils, 1923. Mallory, F.: Principles of Pathologic Histology, 1914.
10. Schridde: Verhandl. d. deutsch. path. Gesellsch. **2**: 360, 1907. Sabin, Florence R.: Contributions to Embryology, Carnegie Inst., Washington, No. 262, **9**: 213, 1920. Doan, C. A.; Cunningham, R. S., and Sabin, Florence R.: Contributions to Embryology, Carnegie Inst., Washington, No. 361, **16**: 163, 1925.
11. Ribbert, H.: Geweben. Ztschr. f. allg. Physiol. **4**: 201, 1904.
12. Goldmann, E. E.: Beitr. z. klin. Chir. **64**: 192, 1909.
13. Marchand, Felix: Verhandl. d. deutsch. path. Gesellsch. **4**: 124, 1901.
14. Aschoff and Kiyono.[3] Kiyono, K.: Die vitale Karminspeicherung, Jena, 1914; Folia haemat. **18**: 49, 1914.
15. Aschoff, L.: Beihefte z. med. Klin. **22**: 1, 1926.
16. Cunningham, R. S.: Am. Rev. Tuberc. **9**: 491 (Aug.) 1924.
17. Doan, C. A., and Sabin, Florence R.: J. Exper. Med. **46**: 315 (Aug.) 1927.
18. Pick, L.: Am. J. M. Sc. **185**: 601 (May) 1933.
19. (*a*) Doan, C. A., and Wiseman, B. K.: Ann. Int. Med., October, 1934. (*b*) Clough, P. W.: Bull. Johns Hopkins Hosp. **51**: 148 (Sept.) 1932.
20. Dameshek, William: Folia haemat. **49**: 64, 1933. Rolleston, H.: Lancet **2**: 1209 (Dec. 12) 1925. Sabin, Florence R.; Doan, C. A., and Forkner, C. E.: J. Exper. Med. **56**: 267 (Aug.) 1932. Bruetsch, W. L.: J. Nerv. & Ment. Dis. **76**: 209 (Sept.) 1932.

1. Hewson, W.: Phil. Tr. **60**: 368, 1770; **63**: 303, 1773.

(f) Downey, Hal: Folia haemat. **34**: 65 (June) 145 (Aug.) 1927.

has been denied chiefly on morphologic grounds. Consequent on this apparent absence of distinguishing features, the similarity of this cell to an undifferentiated primitive mesenchymal cell has in fact been regarded as evidence of absolute identity. There was thus born the unitarian doctrine of the origin of the white blood cells; i. e., that the lymphocyte is a primitive cell from which all other blood cells take origin, the direction of differentiation being determined either by a specific stimulus for maturation in a definite direction or by the influence of the environment, or by both. The most important evidence tending to strengthen this hypothesis has been obtained by means of tissue culture experiments in which "lymphocytes" have been observed to give origin to monocytes, clasmatocytes, red blood cells and fibroblasts. The significance of these conclusions, based on morphologic studies and in vitro cell cultures, has been invalidated to a greater or lesser degree—depending on one's point of view—by the suggestion first of all that morphologic similarities have been mis-

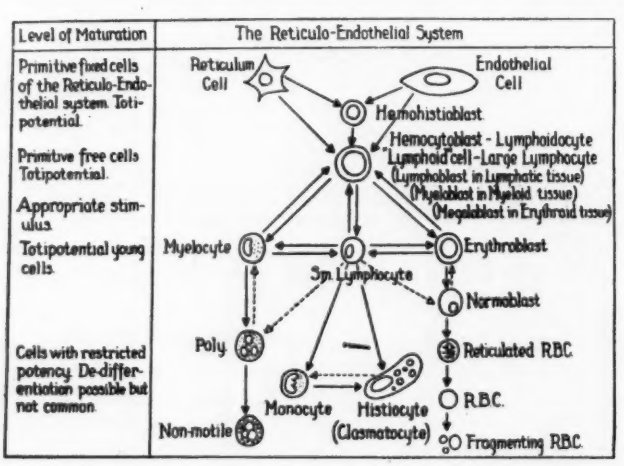

Chart 2.—This chart condenses, by diagram, the monophyletic interpretation of the literature that is concerned with the relationships between the cells of the blood and those of the tissues. A common undifferentiated totipotential cell is postulated and identified with the hemocytoblast of Ferrata, the lymphoidocyte of Pappenheim, and the blood lymphocyte, lymphoblast, myeloblast, megaloblast and monoblast of the polyphyletic adherents. In this theory the small lymphocyte of the blood is believed simply to be a temporary resting phase of the larger lymphoid cell and may differentiate into the other cells, as shown, either directly or after reverting back to the large tissue cell of the Ferrata type. The small or large lymphocyte may also develop into the more mature blood cells directly without going through the maturation phases of these cells, and, finally, after having so differentiated, it may dedifferentiate back to the primitive totipotential level. The reticulum and endothelial cells of the reticulo-endothelial system are believed to be potentially identical, differing only in shape. They give rise to the lymphocytes of the blood, either directly or through a primitive tissue cell similar to the hemohistioblast of Ferrata. Opinion varies between different supporters of the monophyletic school as to the importance of the transition from monocyte and clasmatocyte back to lymphocyte, as well as other minor points intentionally omitted on this chart, in order to emphasize the important concepts involved in this theory of blood formation.

taken for identities; and secondly, that assuming it to be possible to obtain pure lymphocytes from any source without some admixture of primitive, small round cells—which point is also contested—the artificial environmental conditions inherent in tissue culture methods may lead to certain transformations in cells not at all possible under the vastly different conditions prevailing in the animal body.

The unitarian or monophyletic hypothesis, the essential features of which are graphically shown in chart 2, has been variously modified so that two, three or more lines of descent requiring two, three or more separate ancestral blast cells have been hypothesized, each maturing along highly restricted lines without dedifferentiation or metaplasia. There have thus arisen the various interpretations of a polyphyletic doctrine of cell evolution differing from the monophyletic tenets chiefly in the question of the identity and prepotency of the lymphocyte. It therefore becomes clear that the major issue involving an interpretation of the origin of the white blood cells at this time has to do with the question of whether the blood lymphocyte is simply an undifferentiated totipotential primitive cell existing for the chief or sole purpose of giving origin to all the other blood cells; or whether, on the contrary, its identity is separate and distinct from the other mononuclear cells possessing blast characteristics with which it is morphologically similar but not necessarily identical. That all blood cells have a common origin from the reticulo-endothelial system, the lymphocytes arising principally from within [21] or from without [22] the germinal centers in the lymphatic tissues, and the granular cells from the bone marrow, are not points at issue but are accepted by all students of the subject.

It is obvious that differences of a chemical, functional, metabolic, morphologic or pathologic character as between the blood lymphocytes and any or all of the other lymphocyte-like blast cells may be accepted as evidence tending to invalidate the unitarian doctrine. Many questions have been raised in past discussions of this crucial and fundamental point. The chief ones hitherto stressed are given in the accompanying table. The demonstration of a definite life cycle for granulocyte and erythrocyte, with the elaboration of specific granules and finally death as reflected by the "nonmotile" of Sabin in the former,[23] and with the elaboration of hemoglobin and eventual death through fragmentation and phagocytosis [24] in the latter, has gone far in establishing the soundness of the polyphyletic doctrine of cell specificity, at the same time casting grave doubts on the claims for promiscuous metaplasia, so integral a part of the unitarian doctrine. The demonstration of a definitive life cycle for the lymphocyte similar in all respects to that of the granulocyte and erythrocyte, despite the lack of an elaboration of specific products in the cytoplasm coincident with maturation, would require that the unitarian scheme of cell evolution either be abandoned or be altered materially to account for the phenomenon. This demonstration has been made.[25]

THE EVIDENCE FOR A LIFE CYCLE FOR THE LYMPHOCYTE

Although, as intimated before, the lymphocyte does not elaborate any substance or structure in its cytoplasm that is specific for this cell, there are nevertheless certain criteria, significant of age, that are common to this and to all other blood cells: 1. The presence of large nucleoli signify immaturity; in fact, as pointed out by MacCarty,[26] neoplastic anaplasia in a given cell may be determined accurately by comparing the diameter of the nucleolus with that of the nucleus. 2. The

21. Maximow.[3b] Flemming, W.: Arch. f. mikr. Anat. **24**: 50, 338, 1885. Aschoff, L.: Die lymphatischen Organe, Beiheft z. med. Klin., 1926. Wiseman, B. K., in preparation.

22. Hellmann, T.: Beitr. z. path. Anat. u. z. allg. Path. **68**: 333, 1921. Heilmann, P.: Virchows Arch. f. path. Anat. **258**: 52, 1925. Latta, J.: Am. J. Anat. **29**: 159 (July) 1921. Heiberg, K.: Virchows Arch. f. path. Anat. **240**: 301, 1923. Ehrich, W.: J. Exper. Med. **49**: 347, 361 (March) 1929.

23. Sabin, Florence R.: Bull. Johns Hopkins Hosp. **34**: 277 (Sept.) 1923.

24. Rous, Peyton: Physiol. Rev. **3**: 75 (Jan.) 1923.

25. (*a*) Wiseman, B. K.: Folia haemat. **46**: 346, 1932. (*b*) Sabin, Florence R., and Doan, C. A.: J. Exper. Med. **46**: 645 (Oct.) 1927. (*c*) Wiseman, B. K.: J. Exper. Med. **53**: 499 (April) 1931.

26. MacCarty, W. C.; Haumeder, E., and Berkson, J.: Proc. Staff Meet, Mayo Clin. **8**: 38 (Jan. 18) 1933. MacCarty, W. C., and Haumeder, E.: Am. J. Cancer **20**: 403, 1934.

intensity or absence of basophilia and the number of mitochondria in the cytoplasm have been found regularly to vary in association with the degree of maturity of the other blood cells. 3. Finally, the signs of cell death, consisting of a pyknotic nucleus and rupture of the cell membrane, when occurring in the absence of any features of immaturity and in juxtaposition to cells in the same blood smear which show no evidence of damage as a result of the technic of making the preparation, are generally accepted as representing the end of the life cycle.

Published observations describing the maturation of granulocytes have without exception subscribed to the observation, which is confirmed daily in every laboratory where blood cells are examined, that with increasing age there is a corresponding and parallel decrease in basophilic substance and content of mitochondria in the cytoplasm of these cells. In the oldest cells, corresponding approximately to the latter half of the Arneth range, both of these characteristics disappear entirely. The final phase of the life cycle represented by the "nonmotile" leukocyte of Sabin is easily demonstrated in any living preparation and shows unmistakable evidence of the spontaneous, senile cell death already noted. Visible nucleoli are never found in these cells except in those with minimal numbers of granules representing the less mature forms. Similarly, in the red blood cell series maturation of the cell with an increasing volume of synthesized hemoglobin and a corresponding decrease of basophilic and mitochondrial substance has also been adequately demonstrated and universally accepted as a phenomenon which reflects the aging process of this cell. The terminal feature in the life history of this cell is fragmentation, as demonstrated by Rous, a disintegration phenomenon equivalent in significance to the "nonmotile" cell of the granulocyte series. So well established is the belief that basophilism of the red cell is a sign of youth that the presence of polychromatophilia and increased numbers of reticulocytes are used in every clinical laboratory as indexes of regeneration in this group of cells. As in the case of granular cells, nucleoli are found in the nuclei only in those types in which there is a minimum of specific substance in the cytoplasm and a maximum of mitochondria and basophilia, the type universally recognized as the immature form. Studies [27] have likewise indicated that the basic observations interpreted as criteria essential to the establishment of the age of granular and of red cells are true also for the maturation cycle of the monocyte. It may thus be concluded as a demonstrated fact that those cells of the circulating blood that exhibit the elaboration of specific cytoplasmic structures before functional maturity is attained also show change in the nonspecific substances (mitochondria and basophilia) that parallel immaturity. This concept is, of course, identical with that of a life cycle, as it is obviously impossible for cells to become progressively older without including this concept.

A consideration of these facts will make it apparent that any demonstration of an aging process (life cycle) for the lymphocyte must be secured by an analysis of the nonspecific characteristics of the cell. Logic also dictates that the finding of parallel decreases in mitochondria and basophilia in a series of these cells may best be interpreted, by inference and analogy, as possessing a significance similar to that which has been proved for all the other blood cells. Previous work [28] has demonstrated that, in the lymphocytes, changes in mitochondria and basophilia parallel each other. Both of these characteristics range from a maximum concentration in cells in which the vesicular nuclei exhibit large nucleoli to minimal quantities in cells with nuclei devoid of visible nucleoli or to complete absence of mitochondria and basophilic substance in cells, which shows a pyknotic nucleus or a ruptured cell membrane. These facts were interpreted, therefore, as evidence of the existence of a life cycle for the lymphocyte comparable in most respects to those of the other cells of the circulating blood. To date, no other interpretation of these phenomena has been published.

Recent additional work in this laboratory has tended to strengthen this position.[29]

The evidence given for the existence of a life cycle and separate identity, as developed in this experimental work and dependent on nonspecific characteristics, would appear to be the only avenue of approach available at this time to a solution of the problem of the separate identity for the lymphocyte.

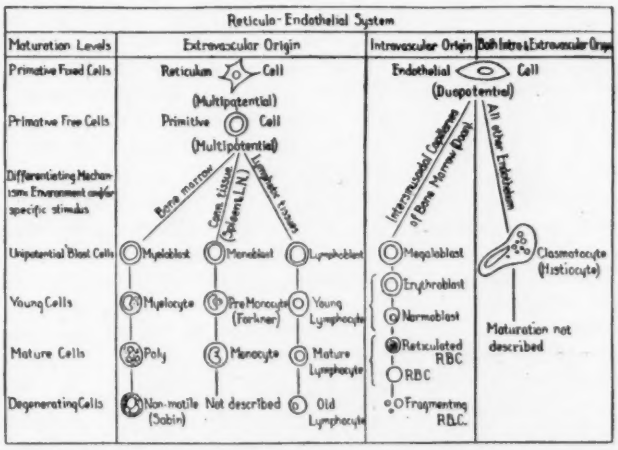

Chart 3.—This chart is a graphic representation of the principal facts of blood formation as interpreted by proponents of the school of complete polyphyletism. This concept involves the separation of the reticulo-endothelial system into reticulum and endothelial cells, each with different prospective potencies. From the reticulum cell is derived a wandering cell of multipotential qualities, which in the presence of suitable stimulus and/or environment differentiates into one of the three blast cells of the white blood cell series. After differentiation, the identity of these several blast cells remains fixed, and further differentiation can proceed only into more mature cells of its own lineage, and only by progressive steps through the various phases of development as indicated on this chart. The red blood cell series are derived from the endothelial cells of Doan's intersinusoidal capillaries of the bone marrow by the progressive steps illustrated. The endothelial cells throughout the reticulo-endothelial system (including the bone marrow) are also the source of the large macrophage or clasmatocyte (histiocyte) and may desquamate either into the tissues or directly into the blood. The relationship between the monocyte and the clasmatocyte is controversial and is explained in full in the text. Many adherents of the polyphyletic school of thought believe that the unitarians are confusing the primitive free cell of the former with the lymphocyte of the latter. If this is true, most of the differences between the two groups of investigators would be eliminated. The tissue lymphocyte of the unitarians would then be identical with the free primitive cell of the polyphyletists, and the blood lymphocytes would be identical save in potency. The proof for a tissue lymphocyte with multipotential qualities separate and distinct from a blood lymphocyte with highly restricted potencies would, in fact, erase most of the differences between these two groups of hematologists.

THE ORIGIN OF THE MONOCYTE AND ITS RELATIONSHIP TO THE CLASMATOCYTE

One of the more difficult problems in the histogenesis of the white blood cells has been concerned with the origin of the monocyte. This no doubt has resulted

27. Cunningham, Sabin and Doan.[3b] Doan.[3d] Sabin, Florence R.; Doan, C. A., and Forkner, C. E.: J. Exper. Med. (suppl. no. 3) p. 52 (Dec.) 1930.

28. (*a*) Wiseman, B. K.: J. Exper. Med. **54**: 271 (Aug.) 1931; (*b*) footnote 25*a*.

29. Experimental data substantiating this position are omitted in this publication but appear in the author's reprints.

largely from the difficulties (more apparent than real) in separating them from the lymphocytes on the one hand and from the clasmatocytes on the other. Largely devoid of specific cytoplasmic structures as observed in fixed sections, and possessing active phagocytic powers similar to the clasmatocyte, it is not surprising that the literature reflects the general confusion that relates to this cell. Originally described by Ehrlich as a "large mononuclear leukocyte" or "transitional form," the lack of definite conviction as to the separate identity of this cell that these terms suggest prevailed until Schilling [32] and Naegeli [31] established it as an independent cell strain. Its close relationship to lymphocytes in both origin and identity has been strongly maintained, largely on a basis of tissue culture work, by Maximow,[33] Weidenreich,[34] Downey,[35] Bloom,[36] Bergel [37] and others. Using similar methods of investigation, however, the Lewises,[38] Parker and Rhoades,[39] Carrel and Ebeling,[40] Hirschfeld [41] and others have denied the conversion of lymphocytes to monocytes. To mention only a few of the widely divergent views, Turk [42] thought them to be peculiar to the spleen and named them splenocytes; Möllendorf [43] derives them from the fibrocytes, Jolly [9] from the endothelium of the lymph node sinuses, Mallory,[44] and McJunkin [45] from the vascular endothelium, Permar [46] from lung endothelium, Naegeli [31] from the myeloblast, Cunningham, Sabin and Doan [35b] and Forkner [47] from a specific stem cell, the monoblast.

Additional evidence bearing on this problem has been obtained by the analysis of the tissue reactions in two pathologic states. In the study of the chemical fractions of the tubercle bacillus isolated by Anderson [48] and biologically tested by Sabin and her group it was found that the lipoid content of the bacillus possessed the specific ability to stimulate the formation of monocytes,[49] the protein and carbohydrate being entirely inert in this respect. It was possible, with the aid of the supravital technic in the areas in which acid-fast bacilli were located, to follow the maturation of typical monocytes from a primitive undifferential cell corresponding in all details with the monoblast of these and other investigators through to the epithelioid cell. It thus became evident that the fibroblast, endothelium and lymphocytes did not partake in the histogenesis of this cell when exposed to the specific monocyte-stimulating substances of the tubercle bacillus.

The establishment of monocytic leukemia as a specific pathologic entity by Reschad and Schilling in 1913 [50] has made possible the study of a second pathologic state that has been especially important in contributing to the solution of the problem of the origin of the monocyte. A review of the literature shows that in almost every case of monocytic leukemia in which the pathologic changes of the tissue have been reported there has been a prominent hyperplasia of the "reticulo-endothelial system." Some of these authors have reported reticulum hyperplasia as predominating.[51] In our experience with eight cases of this disease, we have been particularly fortunate in observing a case of chronic monocytic leukemia in which the tissue elements were not so densely packed as in the acute types, so as to defy the careful study of the origin of these cells. In this case it was possible to follow the steps of the maturation of this cell throughout its entire life cycle. These observations with photographs have been reported in detail elsewhere [19a] so I will not repeat them here except to say that we can confirm the finding of reticular (not endothelial) hyperplasia described by some authors. We could also identify a specific blast cell corresponding to the monoblast of Sabin and follow its maturation into the typical blood monocytes. In this case no signs of hyperplasia of the various other elements, said to give origin to monocytes, were observed, although careful examination was made for them.

The evidence furnished by monocytic leukemia and tuberculosis, two conditions in which there is a specific stimulation of the monocytic strain of cells, has added considerable weight to the hypotheses of Sabin and her co-workers. It would therefore appear that the balance of evidence at this time strongly supports the conception that the origin of the monocyte is by means of a specific primitive stem cell, the monoblast, which in turn takes origin from the reticulum cell, as represented in chart 3.

Much less certain is the relationship of the monocyte to the true clasmatocyte or histiocyte. That there are rather marked morphologic differences in their reaction to the vital dyes neutral red and trypan blue is confirmed by every student of the subject. The monocyte is characterized primarily by a rosette of fine vacuoles about the cytocentrum, which always stain a uniform salmon pink. The clasmatocyte exhibits vacuolization of an entirely different character; the vacuoles are scattered throughout the cytoplasm without definite arrangement, vary greatly in size and display the varying p_H of the intravacuolar fluid by reacting with the neutral red throughout its color range. It is also usual for the clasmatocytes to take up the trypan blue copiously, whereas the monocytes either refuse this dye completely or stain very faintly. Other minor differences pertaining to cytoplasm and nucleus tend to emphasize the morphologic dissimilarity, so that usually there is no difficulty in discriminating between these two cells in the supravital preparation.

Thus, while there can be no question concerning the separate identification of two phagocytic mononuclear cells based largely on the magnitude of their phagocytic powers, certain other facts make it more difficult to dissociate entirely their respective life cycles. Morphologically the shape, staining reactions and structure of the nucleus of the two cells are, if not identical, at least indistinguishable. Each has the same type of motility, subserves the same function and, in general, the two are

32. Schilling-Torgau, V.: Das Blutbild und seine klinische Ververtung, Jena, 1912; Angewandte Blutlehre und seine Tropenkrankheiten, ed. 2, Leipzig, 1914.
33. Maximow, A.: Arch. f. mikr. Anat. **97:** 283, 1923; Proc. Soc. Exper. Biol. & Med. **24:** 570, 1927.
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35. Downey, H.: Anat. Rec. **11,** 1917; **12:** 429, 1918.
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37. Bergel, S.: Ztschr. f. exper. Path. u. Therap. **21:** 216, 1920.
38. Lewis, M. R., and Lewis, W. H.: Contributions to Embryology, Carnegie Institution, Washington **96:** 95.
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42. Turk: Vorlesungen über klinische Hämatologie, Vienna **1,** 1904; **2,** 1912.
43. Möllendorff, W., and Möllendorff, M.: Ztschr. f. Zellforsch. u. mikr. Anat. **3:** 503, 1926.
44. Mallory (footnote 9); J. Exper. Med. **3:** 611, 1898.
45. McJunkin, F.: Am. J. Anat. **25:** 27 (Jan.) 1919.
46. Permar, H.: Am. Rev. Tuberc. **9:** 507 (Aug.) 1924.
47. Forkner, C. E.: J. Exper. Med. **49:** 323 (Feb.) 1929; **52:** 385 (Sept.) 1930.
48. Anderson, R. J.: Physiol. Rev. **12:** 166 (April) 1932.
49. Sabin, Doan and Forkner.[37] Sabin and Doan.[35b]
50. Reschad, H., and Schilling, V.: München. med. Wchnschr. **60:** 1981, 1984, 1913.
51. Bingel, A.: Deutsche med. Wchnschr. **42:** 1503 (Dec. 7) 1916. Hannema, L. S.: Nederl. Tijdschr. v. Geneesk. **1:** 2281 (May 3) 1928. Hittmair, A.: Folia haemat. **37:** 321 (Dec.) 1928. Wyschegorodzewa, W. D., ibid. **38:** 355, 1929. Schwirtschawskaja, B.: Virchows Arch. f. path. Anat. **267:** 456, 1928.

closely associated in most pathologic states in which the stimulus to phagocytosis is dominant. For example, in experimental studies of tuberculosis it has been shown that not only may both monocytes and clasmatocytes form epitheloid cells [52] but giant epitheloid cells may be composed in part of monocytes and in part of clasmatocytes. Furthermore, the presence in the blood stream of both monocytes and clasmatocytes in large numbers as a feature of monocytic leukemia has been reported.[53] Finally it may be said that the entire evidence of tissue culture,[54] the work of the Clarks [55] using the web of the frog, the Sandison [56] window in the ear of the rabbit, and various studies of inflammatory exudates,[57] tends to make probable the concept that the clasmatocyte, at least in some instances, may be derived from the monocyte by hypertrophy and intense development of the phagocytic apparatus preexisting in a modified form in that cell.

This of course does not deny the proved fact, admitted by nearly all authors, that at least in the spleen, lymph nodes, bone marrow, omentum and liver clasmatocytes arise chiefly by mitotic cleavage of the endothelial cells of the reticulo-endothelial system located in those tissues. As recently pointed out by Doan,[3c] it probably is best to regard the origin of the highly phagocytic clasmatocyte as threefold: from the endothelium, from monocytes and from preexisting clasmatocytes.

COMMENT

It is apparent from the foregoing survey that, while radically different positions may be and often are taken by certain extremists who have studied and contributed to the solution of the problem of the origin of the blood cells, the more important concepts involved in this biologic enigma are identical. All, or nearly all, students of the problem derive the white blood cells from the same mesenchymal structure. All, or nearly all, identify a primitive cell that becomes detached from this mother structure and serves as a blast cell for the subsequent derivation of the mature cells that are observed in the circulating blood. Certain groups (the so-called polyphyletic adherents) believe that there is a stage between that of the primitive free cell with multipotential characteristics and the fully differentiated blood cells in which certain immature cells with restricted potencies may be identified and be designated as specific blast cells for specific strains or lineages. Other groups (the so-called monophyletic adherents) deny the evidence for the existence of this intermediate stage of multiple blast cells, defending and supporting the position that the transition from immature to relatively more mature stages may be immediate without interposition of more involved phases. The first group reserves the term "lymphocyte" for the indifferent round cell of the blood; the second group regards all indifferent round cells of mesenchymal origin, whether in blood or in tissues, as "lymphocytes," thereby including under this term the "lymphocytes" and all the blast cells of the polyphyletic proponents.

It is quite obvious that the various theories differ, if one considers only the essential major tenets of the various schools of thought, only in determining how far back in lineage it is necessary to go before a common cell ancestor can be identified. Very few workers in this field, however they may differ in certain details, doubt the evidence for the existence of a single immature cell that has the inherent potencies for the production of any of the several white blood cells. Nearly all workers of both schools of thought believe that the direction of differentiation is determined or mediated by the influences of local environment and/or by a specific stimulus of unknown type.

The many and conflicting detailed explanations that have been advanced in an attempt to explain more fully the mass of experimental and objective observations pertaining to these cells in terms of life histories represent the transition phase of uncertainty between the well established facts of the present and the ultimate certainty of the future. The solution, in all its details, to the problem of the origin of the white blood cells which will be acceptable to all can be a realization only of the more distant future. It is probable that the development of present technical methods of investigation or the acquisition of new ones must precede the final disposition of the problem.

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52. Tompkins, E. H., and Cunningham, R. S.: Bull. Johns Hopkins Hosp. **48**: 8 (Jan.) 1931.
53. Laurence, J. S.; Josey, A. I., and Young, M. W.: Folia haemat. **44**: 332, 1931.
54. Carrel and Ebeling.[40] Awrorow, P., and Timofejewsky, A.: Virchows Arch. f. path. Anat. **216**: 184, 1914. Maximow, A. A.: Klin. Wchnschr. **4**: 1486 (July 30) 1925.
55. Clark, E. R., and Clark, E. L.: Am. J. Anat. **46**: 149 (July) 1930.
56. Sandison, J. C.: Am. J. Anat. **41**: 447 (July) 1928.
57. Maximow, A.: Beitr. z. path. Anat. u. z. allg. Path., supplement 5.

ABSTRACT OF DISCUSSION

DR. CHARLES A. DOAN, Columbus, Ohio: The results that have been presented today testify to the ingenuity and logical sequence of Dr. Wiseman's studies and to their potential clinical significance. With the establishment of criteria on which one may base the general conclusion that the lymphocyte is a separate and distinct entity with an independent life cycle has also come the means of appraising the efficiency of production of these elements. In our laboratory we are using every day the so-called Wiseman qualitative differential of the lymphocytes, because it gives a far more accurate interpretation of the activity of the lymphopoietic system than the quantitative data alone. Even as Arneth and Schilling established the differential qualitative changes in the granulocytes, which are now indispensable to the intelligent understanding of the response to infection, so qualitative changes in the lymphocytes are proving to be far more important than any quantitative variations alone. We have already applied the principles outlined by Dr. Wiseman to a study of both experimental and clinical tuberculous disease. The various adenopathies and the leukemias involving the lymphatic system are being approached with such qualitative studies of the peripheral lymphatic elements with complete verification of the original hypothesis. Warburg studies of cellular respiration are now being correlated with definite age range variations in the lymphocytes, which bid fair to shed further light on their functional specificity and capacities. I believe that this recognition of the lymphocyte as a physiologic entity, established on a morphologic basis, has been a necessary prerequisite to the further study and solution of some of the many clinical problems involving these cells. Any evaluation of the blood picture in disease is now incomplete without the inclusion of the data on the qualitative appraisal of the lymphocyte.

Psychoses in Pernicious Anemia.—The actual incidence of psychotic changes in pernicious anemia is widely estimated by different observers, probably on account of the individual differences of opinion as to what constitutes a psychosis. Thus Cannon and Hayes in a recent textbook of psychiatry state that 5 per cent of patients with pernicious anemia develop distinct mental changes, while Läufer found only one case of insanity in 190 cases of this anemia, and he quotes various authorities who have found the incidence even less than this. The differences in individual conceptions of psychotic changes become plain when the symptoms described as occurring are reviewed. —Parfitt, D. N.: Psychoses Associated with Pernicious Anemia, *J. Neurol. & Psychopath.* **15**:12 (July) 1934.

THE EFFECT OF INITIAL TUBERCULOUS INFECTION ON SUBSEQUENT TUBERCULOUS LESIONS

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The effects of tubercle bacilli on experimental animals under various conditions have been reported on, but the lifetime of the animals used is so short compared with that of man and the resistance and susceptibility of the different species vary so much that it is impossible to determine in them all that is needed to be known about tuberculosis in the human body. It has been believed for some time that tuberculous lesions that appear in the bodies of children are of two types, namely, the first infection and the reinfection types, but very little work has been done to determine the effect of one on the other. In 1921 we undertook a longitudinal study of tuberculosis in the bodies of children. Since that time we have examined and studied 12,095 children and have observed each type of tuberculosis in its various stages of development, as well as the relationship of one type to the other.

FIRST INFECTION TYPE OF TUBERCULOSIS

Tuberculous lesions which develop in tissues that are not sensitive to tuberculoprotein are designated as primary lesions, first infection type of lesions, or, if in the lung, childhood type of tuberculosis. These lesions usually begin microscopically, and the first indication of their presence in the living body is the positive tuberculin reaction. Their location is never detected during life in the majority of cases. In a minority of patients, however, in whom the lesion is near the surface of the body, it may be located by the usual methods of examination. When in a part of the body which lends itself well to roentgen examination, such as the lung, it may become sufficiently large to cast a shadow that is visualized on the x-ray film. If it was observed early on roentgen examination, we have seen it pass through a stage known as the inflammatory or pneumonic stage, which persists several months to a year or more before resolution is complete. At some later time, varying from months to years, lime deposits may make their appearance in the region of the original primary lesion. One of the characteristics of the first infection type of tuberculosis is that the regional lymph nodes nearly always become involved and their disease passes through the stages already mentioned almost simultaneously with the first infection focus itself.

The diagnosis of the first infection type of tuberculosis is made primarily by the tuberculin test. The roentgenogram plays a minor rôle, while symptoms and physical signs are of little value.

Although we have been cognizant of the fact that the tuberculin test is not infallible and that there are on record a number of cases of frank tuberculosis, even presenting tubercle bacilli in the sputum, which react negatively to the test, we feel that these are very exceptional cases and that, generally speaking, when the test is negative no tuberculosis exists. We are now using the new tuberculin known as purified protein derivative, prepared on Dorset's synthetic medium and purified by the method of Long and Seibert. This promises to be even more specific than old tuberculin. Thus, we look on the intracutaneous tuberculin test as a very fine screen and recommend it strongly as the initial phase of every examination for tuberculosis. It appears that a number of physicians have confused it with the subcutaneous test and regard the former as dangerous to use among patients who may have clinical tuberculosis. We have never seen any flare up of either a first infection or a reinfection type of tuberculosis that could be attributed to the intracutaneous test. Therefore, we consider it entirely without harm when properly administered. Dr. Edith Boyd of the department of anatomy kindly consented to make the statistical analyses of the incidence of reactions to the tuberculin tests with the technical assistance in computations of two Civil Works Administration workers.

Of the first 1,000 children examined, 41.6 per cent reacted positively to the test. As the epidermal (Pirquet) test was used at that time and only one test was given, we are of the opinion that our incidence of positive reactors was too low. This statement is based on subsequent comparisons between the epidermal and the intradermal tests. However, the incidence decreased until in 1933 only 23.6 per cent reacted positively. Thus, between 1921 and 1933 there has been a decrease of almost one half of the positive reactors (chart 1).

Apparently, there has been considerable decrease in the incidence of positive reactors among children in various parts of the country, as shown by Slater, Tice and Hruby, Chadwick, Peck and others. If the tuberculosis activities continue, it is obvious that the time is not far distant when the child who reacts positively to the tuberculin test will be a rarity. Already in some parts of the country instead of saying, as was formerly said, that approximately 95 per cent of girls and boys have been infected by the time they reach the teen ages, it is now possible to say that approximately 90 per cent of such girls and boys have not been contaminated by the time they reach this age period.

The next step in the diagnosis of tuberculosis in children is the roentgenogram of the chest. During the early period of our work at the Lymanhurst School we did not make roentgenograms as a routine, but as time passed we recommended stereoscopic films of the chest of every child. This included both negative and positive tuberculin reactors. At the close of ten years of work we had found so little evidence of tuberculosis in the chests of children who reacted negatively to the test that we decided to make films of only the positive reactors, being thoroughly cognizant of the fact that there would be an occasional failure. Moreover, we came to the conclusion that a single film of the chest suffices save for the exceptional case.

The value of making roentgenograms as a routine, regardless of the tuberculin reaction, is that other chest conditions may be detected. In chart 2 the incidence of abnormalities found in both the negative and the positive reactors is seen. This includes not only tuberculous lesions of first and reinfection types but also pleurisy, bronchiectasis, pneumonia, increased bronchovascular markings, cardiac changes, and the like.

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Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author on receipt of a stamped addressed envelop.

The roentgenogram of the chest in the diagnosis of the first infection type of tuberculosis is of far less value than was formerly believed. At one time there was a tendency to look on the child who had negative roentgen signs as one possessing no lesion of significance, but observation and analysis of cases soon led us to

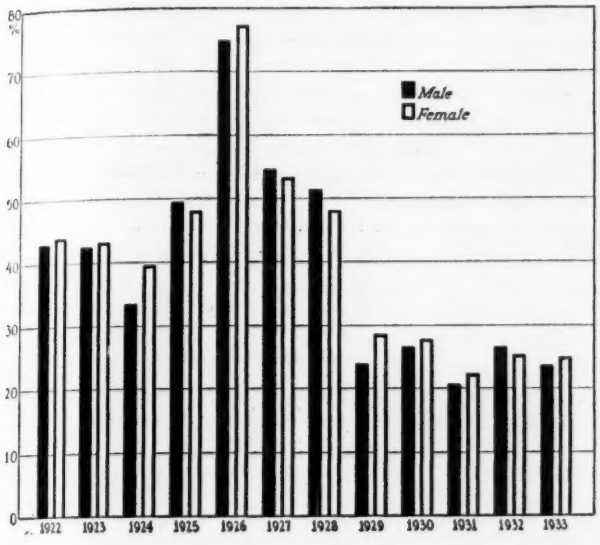

Chart 1.—Annual incidence of positive tuberculin tests in 10,775 cases.

conclude that the roentgenogram is a very crude method of inspecting the body for first infection type of foci. Therefore we now rate the child who reacts positively to the tuberculin test and has negative roentgen signs as one with a definite focus of tuberculosis somewhere in the body. We no longer make exposures in lateral and oblique diameters in order to visualize deposits of calcium in the posterior mediastinum, nor do we make exposures through the cervical and abdominal regions to discover such deposits. The positive tuberculin test tells us that at least one first infection focus is present. The postmortem studies of Miller have shown that, when the first infection focus is located in the chest, the roentgenogram fails to reveal its location in 75 per cent of the cases. Other workers have found that it fails in even a higher percentage.

Observations on young adults who first become infected with tubercle bacilli have shown that they also develop a very benign first infection type of disease, just as is seen in the infant and child. This is one of the most encouraging facts that have been added to the knowledge of tuberculosis in recent times, since it completely breaks down the opinion so long held that the young adult who has not previously received a so-called protective dose of tubercle bacilli develops a rapidly progressive type of disease with the first infection. Thus, the program of prevention has been sound. The longer one can postpone the first infection with tubercle bacilli, the better. The ultimate goal is so to reduce the foci of infection that all persons will be able to pass through the span of life without contamination with tubercle bacilli. This the veterinarian has accomplished for cattle.

REINFECTION TYPE OF TUBERCULOSIS

The reinfection type of tuberculosis develops on tissue that is sensitive to tuberculoprotein. In nature, so far as is known, such sensitiveness is produced in the human tissues only by a first infection type of tuberculosis.

Reinfection foci have quite a different effect on the tissues than do those of first infection. While it is true that many of them are brought under control, it is also true that they tend to be destructive. They may be divided into two groups, acute and chronic. The best examples of acute reinfection types of tuberculosis are miliary disease and diffuse meningitis. Both develop on sensitive tissues and are highly destructive. Meningitis usually results from a focus in or near the central nervous system, which discharges bacilli directly or indirectly into the subarachnoid space. Miliary tuberculosis also results from a previously existing focus, often a tuberculous lymph node, which through rupture or otherwise discharges into a blood vessel or a large lymphatic duct, thus feeding the blood stream with tubercle bacilli. Without the previously existing focus that renders the tissues allergic and then feeds the blood stream with bacilli, miliary tuberculosis does not develop.

Good examples of the chronic form of reinfection type of tuberculosis are disease of the bones, joints and lungs. In the lungs the two main characteristics are fibrosis and cavitation. In the diagnosis of the reinfection type of pulmonary tuberculosis the tuberculin test is of little value, since it becomes positive with the development of the first infection type. However, among persons who have never previously been examined, the test is of great value. One must constantly bear in mind that it gives no information regarding the presence of a reinfection type of lesion. Symptoms and physical signs are usually late manifestations of the reinfection type of pulmonary tuberculosis. Here the roentgenogram is the most valuable diagnostic agent.

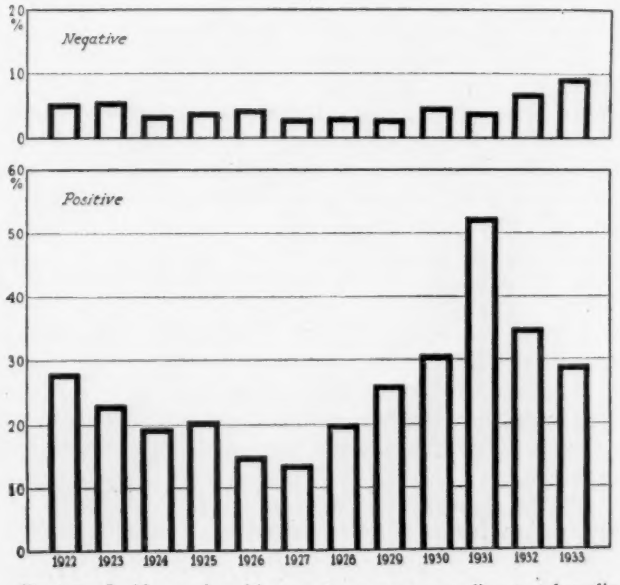

Chart 2.—Incidence of positive roentgenograms according to tuberculin tests.

Although this type of tuberculosis may be present in the lung a long time before it is sufficiently large to cast a shadow visualized on the x-ray film, it will be detected by the film in most cases earlier than by any other method of examination.

The question often arises as to which groups of children especially need roentgen examinations of the chest.

For several years at the Lymanhurst School we made stereoscopic films of all the negative as well as the positive tuberculin reactors but found that the test rarely failed when unmistakable tuberculous lesions were revealed by other phases of the examination. In fact, among 4,148 negative reactors there were only two who had definite evidence of the reinfection type of pulmonary tuberculosis. We concluded that, since only one case of frank reinfection type of pulmonary tuberculosis was missed by the tuberculin test in 2,074 examinations, we were hardly justified in using the taxpayers' money to make roentgenograms of the chests of negative reactors.

Under the age of 10 years, the chronic reinfection type of pulmonary tuberculosis is not a common disease. In fact, among the 12,095 children examined at the Lymanhurst School the reinfection type of pulmonary tuberculosis was found in sixty-two cases at the first examination. In this group, one was 6 years old, two were 7 years old, three were 9 years old, and the remainder were older. Thus, a patient with the reinfection type of pulmonary tuberculosis under the age of 10 years was found only once in each 2,016 examinations. Since roentgenograms are considered of value mainly in the detection of the reinfection type of disease in the lungs and since it was found so rarely in our group of children under 10 years of age, we have decided not to make roentgenograms of the chests even of the children who react positively but have not yet reached the tenth year unless there is some special indication. The cost is too great to justify the small finding. This also applies to private practice, among children of parents who cannot afford frequent roentgenograms. This finding seems to us to be of great practical significance, since a vast number of roentgenograms have been made and larger numbers are being recommended for children in this age period when pulmonary tuberculosis of the reinfection type is so rare. We find, however, that after the age of 10 years, the incidence of the reinfection type of tuberculosis in the lungs increases and is usually said to reach its peak at about the age of 25 years, after which it slowly decreases, but it still remains the first cause of death in this country until the age of 40 or 45 years. Therefore, in instructing parents of our clientele and in directing case-finding surveys and the like, we are able to call attention to the period of greatest danger during which roentgenograms should be made periodically. From the group we have observed, this period begins about the age of 10 or 11 years. In fact, in the remaining fifty-six children who were found to have the reinfection type of pulmonary tuberculosis at the first examination, the average age was 14.2 years.

Seventy-four children had nonpulmonary reinfection types of tuberculosis when they first came to us for examination.

At the first examination of 12,095 children the reinfection forms of tuberculosis were present in 136.

RELATIONSHIP BETWEEN THE FIRST INFECTION AND REINFECTION TYPES OF TUBERCULOSIS

The effect of the first infection type on the reinfection type of tuberculosis has in recent years been studied by five main methods.

The fourth method consists of observing groups of children or adults who are negative to the tuberculin test through periods of exposure, after which the tuberculin test becomes positive, then, over a period of years to determine the types of lesions which appear. This has been carefully done in sufficiently large numbers of children, as well as students of nursing and medicine, that in the same bodies can be seen the complete evolution of tuberculosis from the time the tuberculin test was negative, through the exposure, the first appearance of the positive reaction, the later demonstrable first infection type of lesion on the x-ray film, and still later the reinfection type in the minimal, moderately advanced and far advanced stages.

Incidence of Reactions to Tuberculin Tests and of Clinical Tuberculosis on First Examination and on Subsequent Examinations *

First 4,000 Children Examined (1922-1926)			
1,816 untraced 1930-1934	819 positive		45.1 ± 1.17
	927 negative		51.0 ± 1.17
	70 no test		3.9 ± 1.43
2,176 traced 1930-1934	1,017 positive 46.7 ± 1.07	35 had reinfection type on first examination	3.4 ± 0.57
		43 developed reinfection type subsequently	4.2 ± 0.63
		31 died, nontuberculous cause	3.1 ± 0.54
	1,058 negative 48.6 ± 1.07	5 had reinfection type on first examination	0.5 ± 0.20
		8 developed reinfection type subsequently	0.8 ± 0.26
		32 died, nontuberculous cause	3.0 ± 0.53
	99 not tested 4.6 ± 0.45	6 had reinfection type on first examination	6.0 ± 2.40
		2 developed reinfection type subsequently	2.0 ± 1.41
		1 died, nontuberculous cause	1.0 ± 1.00
Second 4,000 Children Examined (1926-1930)			
1,014 untraced 1930-1934	511 positive		50.4 ± 1.57
	484 negative		47.7 ± 1.57
	19 no test		1.9 ± 0.42
2,984 traced 1930-1934	1,169 positive 39.2 ± 0.89	40 had reinfection type on first examination	3.4 ± 0.53
		16 developed reinfection type subsequently	1.4 ± 0.35
		9 died, nontuberculous cause	0.8 ± 0.26
	1,781 negative 59.7 ± 0.90	4 had reinfection type on first examination	0.2 ± 0.10
		4 developed reinfection type subsequently	0.2 ± 0.10
		12 died, nontuberculous cause	0.7 ± 0.20
	34 not tested 1.1 ± 0.20	1 had reinfection type on first examination	0.3 ± 3.89
		0 developed reinfection type subsequently	0.0 ± 4.00
		0 died, nontuberculous cause	0.0 ± 4.00
Third 4,000 Children Examined (1930-1934)			
None untraced 1930-1934	Positive		
	Negative		
	No test		
4,088 traced 1930-1934	965 positive 23.6 ± 0.66	30 had reinfection type on first examination	3.1 ± 0.56
		3 developed reinfection type subsequently	0.3 ± 0.17
		1 died, nontuberculous cause	0.1 ± 0.10
	3,107 negative 78.5 ± 0.64	1 had reinfection type on first examination	0.03 ± 0.00
		1 developed reinfection type subsequently	0.03 ± 0.00
		3 died, nontuberculous cause	0.10 ± 0.05
	16 not tested 0.4 ± 0.10	1 had reinfection type on first examination	6.3 ± 6.05
		0 developed reinfection type subsequently	
		0 died, nontuberculous cause	

* Percentage incidence, with its standard error indicated thus: 0.0 ± 0.00.

The fifth method consists of studying groups of children, both positive and negative reactors, over a period of years to determine which group provides more clinical cases of tuberculosis. This we have done at the Lymanhurst School for Tuberculous Children since 1921. Recently we have attempted to trace the children who have been examined in this institution. The accompanying table shows that, of 3,992 examined from 1922 to 1926, 1,816 have not yet been traced, of whom 819

were positive, 927 were negative and 70 were not tested when first examined. Of the 2,176 who have been traced since 1930, 1,017 had positive reactions, 1,058 negative, and ninety-nine were not tested on first examination. Of the 1,017 who had positive reactions, thirty-five already had the reinfection type of tuberculosis when first examined and forty-three others have developed this type of disease subsequently. Of the 1,058 negative reactors on first examination, five had the reinfection type of disease at that time and eight have developed it subsequently. Of the five who were negative to tuberculin but showed evidence of the reinfection type of disease on first examination, two had tuberculosis of the bones and joints, two had pulmonary tuberculosis, and one had both pulmonary and bone and joint disease. Of the eight who were negative when first examined but subsequently developed tuberculosis, six had pulmonary disease, one had pleurisy with effusion, and another had tuberculosis of the bone. Between the time we first saw them and when they were next seen with clinical disease, there was an average interval of six and one-half years. One of these children who was negative to the test in 1922 showed a positive reaction in 1926. At that time there was no evidence of clinical disease. However, in 1927 this child had tuberculosis of the sternum. Another child was negative in 1925; in 1926 the test had become positive but there was no evidence of clinical disease. In 1930 this child returned with pulmonary tuberculosis. Thus, an average period of six and one-half years existed between the time of our original examination and the development of pulmonary tuberculosis, which is ample time for children to become exposed, pass through the first infection type of disease and develop the reinfection type. Therefore, from the group of 1,017 who were originally positive to the tuberculin test, 4.22 per cent have developed clinical tuberculosis subsequent to our first examination, while 3.44 per cent had clinical disease on the first examination, making a total of 7.66 per cent who have died or already have clinical disease. Whereas, from the group of 1,058 who were originally negative reactors, only 0.75 per cent have developed clinical tuberculosis, while 0.47 per cent had clinical disease on the first examination, making a total of 1.22 per cent. Thus, the chances of positive and negative reactors having clinical disease or developing it in the next few years are seven to one in favor of the positive group.

If one divides the first group in the table into fourths, some rather interesting figures come to light. In the first fourth 3.73 per cent of the patients had the reinfection type of disease on first examination, while 5.8 per cent have developed it subsequently. Thus, 9.53 per cent of this group are already ill or have died from tuberculosis; whereas, of those traced who reacted negatively on first examination none had the reinfection type when first examined and only 1.08 per cent have subsequently developed it. The average age of the first fourth is now 20.8 years. Here the chances of positive and negative reactors having clinical tuberculosis or developing it by the time they have reached the age of 21 years is nine to one in favor of the positive reactors. Of the last fourth in the group included in the table 2.32 per cent had the reinfection type on first examination, while 3.19 per cent developed it subsequently. Among those traced who originally reacted negatively to the test, 0.66 per cent had the reinfection type of disease at the first examination and none has since developed it. The present average age of the last quarter of the first group included in the table is 15.86 years.

Of those in the table who developed the reinfection type of disease subsequent to the first examination, forty had pulmonary tuberculosis. The average age at which this group of forty was diagnosed was 18.15 years. This finding would seem to be very significant when one considers that the mortality from tuberculosis does not reach its peak until about 25 years and continues to be the leading cause of death until 40 or 45 years. Therefore, there is ample time for considerable more destruction among this group of girls and boys.

The table shows that, of 3,998 children examined from 1926 to 1930, 1,014 have not yet been traced, of whom 511 were positive to tuberculin, 484 negative, and nineteen were not tested on the original examination. Of the 2,984 who have been traced, 1,169 had positive reactions, 1,781 had negative reactions, and thirty-four were not tested at the first examination. Of the 1,169 who had positive reactions, forty already had the reinfection type of tuberculosis when first examined and sixteen have developed it subsequently. Of the 1,781 negative reactors at the first examination, four had the reinfection type of disease when first examined and four have subsequently developed it. Thus, among those who had positive tuberculin reactions at the first examination, 3.42 per cent already had the reinfection type and 1.36 per cent developed it subsequently, making a total of 4.78 per cent who are ill or have died of tuberculosis, whereas among 1,781 who had negative tuberculin reactions at the first examination, 0.22 per cent had the reinfection type when first examined and 0.22 per cent later developed it, making a total of 0.44 per cent with clinical forms of tuberculosis. Here again one must take into consideration the average age of these children at the present time. In the first quarter of the second group in the table the average age is now 15.74 years; the second quarter, 14.19 years; the third quarter, 13.25 years, and the fourth quarter, 12.36 years. Thus, this group is well below the age when the reinfection type of tuberculosis becomes most destructive.

The table also shows that, of 4,088 children examined from 1930 to July 1934, 965 reacted positively, 3,107 reacted negatively, and sixteen were not tested. Of the 965 positive reactors, thirty had the reinfection type of disease at the first examination and three later developed it, whereas, of the 3,107 negative reactors, one had the reinfection type of disease at the first examination and one developed it subsequently. The children in the first, second, third and fourth quarters of this group are now respectively 11.93 years, 10.89 years, 9.49 years and 8.5 years of age. Thus, this group is far below the age when the reinfection type of tuberculosis becomes very destructive in the human body.

Dr. Edith Boyd has made the following explanation of the statistical constants and interpretation of the incidence of reactions to the tuberculin tests and the presence of clinical tuberculosis in the three groups included in the table:

When the difference between two percentage incidences is three times its standard error (standard error of first per cent^2 + standard error of second per cent^2), such a difference would occur by chance for similar sized samples drawn from the same population only six in a thousand times. Hence, in conservative statistical practice, a difference which is three or more times its standard error is assumed to be significant; i. e., the samples probably came from different populations, and

one which is less than three is not significant; i. e., the samples probably came from the same population. In less conservative practice, the ratio of 2, which indicates five chances in a hundred, is taken as the dividing line.

Using the more conservative criterion, the percentage incidences in the table may be interpreted as follows:

In the first group of 4,000 children examined, the proportion of positive and negative tuberculins and no tests made are not significantly different in the untraced and traced groups; therefore, the traced group is probably a reasonable sample of the children at first examination. As would be expected, the 3.4 per cent incidence of clinical tuberculosis on first examination in the positive tuberculin group was significantly higher than the 0.5 per cent incidence in the negative tuberculin group. The latter probably represents faulty technic in administering the tuberculin or errors in reading or recording the test. In the group of children with positive tuberculin tests but without clinical tuberculosis on reexamination, eight years later 4.2 per cent had developed clinical tuberculosis, while in the comparable group with negative tuberculin tests only 1.0 per cent developed clinical tuberculosis.

In the second group of 4,000 children examined, the traced group contained an unduly low proportion of positive tests as compared with the untraced group, indicating some unaccounted for selective factor. Nevertheless, the proportion of clinically active cases in the groups with positive and negative tests at first examination remains the same as in the first group examined. The proportion of clinical cases occurring on reexamination among the group with positive tuberculin tests on first examination is significantly lower than in the first group, probably due to the short time interval between examinations.

In the third group of 4,000 children examined, when all children were traced about two years after the first examination, the percentage of clinically active cases in the positive cases on first examination remains the same as in the first and second groups while the incidence on reexamination is significantly lower than in the second group. In this total group the incidence of positive tests has been significantly reduced, so the number of cases of clinical tuberculosis in children at first examination has been reduced, even though the proportion in the positive tests remains the same.

In summary, during the past twelve or thirteen years the incidence of positive tuberculin tests in school children averaging 8 years of age has significantly decreased from 41.6 to 23.6 per cent. The proportion of the children with positive tests who had clinical disease on first examination has remained approximately 3.4 per cent. In the children with positive tuberculin tests on first examination, clinical tuberculosis had developed in 4.0 per cent of the first group reexamined about eight years later, in 1.4 per cent of the second group reexamined about six years later, and in only 0.3 per cent of the third group reexamined about two years later. In the children with negative tuberculin tests, less than 0.8 per cent developed clinical tuberculosis at a subsequent time. The incidence of clinical tuberculosis occurring in a group of children about eight years after their tuberculin tests were known to be positive is about five times as great as in a group known to have negative tuberculin tests.

Thus, from five methods of study used in recent years, we have come to look on the first infection with tubercle bacilli, as manifested by the positive tuberculin reaction, as a double health liability. First, because it has been shown that once tubercle bacilli are taken into the body and become encapsulated, they remain alive and virulent over long periods of time. Evidence has led to the suggestion that nature may defeat her purpose in that she first encapsulates with fibrous tissue and sometimes with calcium and even true bone but later resorbs this material and thus sets free the formerly imprisoned bacilli. Thus, apparently little or no control is possible over the foci of bacilli once they are allowed to develop in the human body. If one considers this fact alone and completely overlooks the possibilities of exogenous reinfection, there is enough evidence to support whole-heartedly the present campaign which aims at the prevention of the first infection of the human body with tubercle bacilli.

The second health liability is the allergy produced by the development of the first infection type of disease, which is manifested by the positive tuberculin reaction. Krause, Rich and others have called attention to the fact that allergy is a dangerous element from the standpoint of subsequent tuberculosis development. Rich says:

> The damage done by allergy in this disease is very serious, indeed. A great part of the tissue destruction in tuberculosis is due to hypersensitivity to the protein of the tubercle bacillus. . . . Allergy converts the comparatively harmless protein of the tubercle bacillus into a virulent poison.

Wingfield says:

> For a great number of our successfully treated cases one of the important factors in their prognosis, then, is their degree of sensitiveness. If this is high they are in greater danger than if it is low.

Chadwick says:

> We know that the adult type of this disease can develop only in sensitized tissue made so by a preceding infection, and that the lesions caused by that early infection are often the source of the bacilli that produce the pulmonary tuberculosis of later years.

Thus, the tuberculosis control program which the medical profession has practiced in close cooperation with the National Tuberculosis Association and its component organizations has been sound, since its chief aim has been to protect the infant, the child and the adult against contamination with tubercle bacilli. We formerly thought it was good for a child to receive what we called a small dose of bacilli. At that time, we eased our consciences by saying that we were preventing massive doses but still allowing the child to receive small so-called protective doses. Obviously, any such teaching today would be looked on as absurd, since there is no measure or control of dosage and since even a small dose of bacilli, which leads to the first infection type of disease, produces a double health liability.

SUMMARY

1. The incidence of positive tuberculin reactors among children examined at Lymanhurst decreased 18 per cent from 1921 to 1934.

2. The first infection type of tuberculosis begins to develop on tissue that is not sensitive to tuberculoprotein. The immediate reaction is not specific but may be likened to that of a foreign body of the particulate type. The first infection type of tuberculosis observed from its early appearance over many years has not been seen to cause significant destruction. It is benign and is brought well under control in the majority of cases by the protective mechanism of the body. This is true not only in the bodies of children but also in young adults when they first become infected with tubercle bacilli.

3. The tuberculin test is the only fine screen available in the diagnosis of the first infection type of tuberculosis in children. It detects the presence of the disease long before other methods of examination are of any avail and in the majority of cases remains the sole diagnostic agent during life.

4. The roentgenogram fails to locate the lesion of first infection type in 75 per cent or more of the children who react positively to the tuberculin test. In the 25

per cent or less located by roentgen examination the lesions usually are not of clinical significance. Therefore the film gives no information of value beyond that provided by the tuberculin test. History of symptoms and physical examination are of little avail.

5. The reinfection type of tuberculosis develops on sensitized tissue, which meets it with a specific reaction. Good examples of the acute forms of the reinfection type of disease are tuberculous meningitis and miliary tuberculosis. Chronic forms are frequently seen in the lung parenchyma, bones and joints. Although chronic forms of reinfection type of tuberculosis may come under control, they have a strong tendency to progress and cause much destruction of tissues and result in illness and death.

6. The tuberculin test gives no aid in the diagnosis of the reinfection type of tuberculosis. However, this type of disease develops only among positive tuberculin reactors, made so by previous first infection type of disease.

7. The roentgenogram is the most valuable aid in the detection of the reinfection type of pulmonary tuberculosis. Usually it reveals the lesion months and even years before symptoms or abnormal physical signs are present and before tubercle bacilli can be detected by laboratory methods.

8. Children and young adults with negative tuberculin reactions so rarely show other evidence of tuberculosis as to make roentgenograms of all negative reactors unpractical as far as the finding of tuberculosis is concerned.

9. The chronic reinfection type of pulmonary tuberculosis is not commonly seen under the age of 10 years. In the present group it occurred only once in each 2,016 examinations. Therefore, to make roentgenograms of the chests of children under the age of 10 years is not practical when funds are limited, from either public sources or private families. After the age of 10 or 11 years, roentgenograms should be made periodically of the chests of all positive reactors.

10. The effect of the first infection type of tuberculosis on the reinfection type has in recent years been studied by five main methods:

(*a*) By animal experiments, which have shown that the animal tissues react to the first infection with tubercle bacilli as to a foreign body of the particulate type. After the tissues have been sensitized, however, reinfections are met by a specific reaction which often results in the destructive type of lesion.

(*b*) By postmortem examinations. When carefully performed, postmortem examinations have shown that a first infection type of lesion can nearly always be demonstrated in the bodies of persons who have had the reinfection destructive type of disease. This is true of acute forms of the reinfection type, such as meningitis and miliary tuberculosis, as well as chronic forms, such as pulmonary tuberculosis.

(*c*) By roentgen studies. Here is sought in frank cases of reinfection type of pulmonary tuberculosis roentgen evidence of the first infection type of disease. In from 50 to 75 per cent of cases the coexistence of the two types in the same chest is seen. This is very significant when one considers that the roentgenogram is a crude method of detecting the first infection type of lesion in the chest.

(*d*) By observing negative reactors after they become positive. This method has made it possible for one to observe the evolution of tuberculosis in the bodies of human beings from the time when there is no evidence except the positive tuberculin test until the individual has far advanced pulmonary disease. In these cases the first infection type of disease always precedes the destructive clinical type.

(*e*) By observing children, both positive and negative reactors, over years to determine which group affords more cases of clinical tuberculosis. Of all the children traced who were previously examined at the Lymanhurst School, we have found that five times as many who had positive tuberculin reactions at the first examination have subsequently fallen ill as those who had negative reactions at the first examination. Among a group of children first examined in 1921 and 1922, of those who were recently traced, it was found that 9.53 per cent of the original positive reactors either had at the time of the first examination or have subsequently developed clinical tuberculosis, while among the negative reactors only 1.08 per cent have clinical disease. Therefore, in this group the chances of positive tuberculin reactors having or developing clinical tuberculosis in the next ten or twelve years is approximately nine times as great as among the negative reactors.

11. The first infection type of tuberculosis carries a double health liability, first, because in the foci of this type of tuberculosis tubercle bacilli remain alive and virulent over long periods of time and often for the lifetime of the individual. Whenever they are set free on allergic tissue they are capable of producing reinfection destructive type of disease, either acute or chronic, depending on the location and conditions. Second, because allergy results, which is a very dangerous factor, since it is responsible for a great part of the tissue destruction in tuberculosis and since it "converts the comparatively harmless protein of the tubercle bacillus into a virulent poison."

12. The program of tuberculosis control in this country is sound, because it aims to prevent the first infection type of tuberculosis from developing in the bodies of children and adults. To protect against this condition with its double health liability is a much sounder policy than any method aimed at immunization, which at best is questionable and which allows subsequent contamination.

ABSTRACT OF DISCUSSION

DR. HORTON R. CASPARIS, Nashville, Tenn.: There is no doubt that there must be a first infection before tuberculosis can develop. Ideally, the problem is to prevent the first infection; but from the practical standpoint Dr. Wallgren produces tuberculous infections in an attempt to immunize or carry a relative degree of immunity against subsequent infection. Practically all experimental data suggest that an infection that does not produce disease immediately carries with it a relative degree of immunity. Dr. Myers speaks of the double health liability in all of these infected individuals. There is no doubt about the first health liability, that is, that the presence of infection is potential tuberculosis, but as far as the second health liability is concerned, I think there is some question as to that. It seems rather remarkable that probably 30,000,000 or 40,000,000 persons have this infection with the sensitization of tissue, and that no more have manifested tuberculosis. It is evident that many from time to time receive subsequent inoculations of tubercle bacilli without manifesting any demonstrable reaction to those. In the cases that Dr. Myers showed, naturally those children who were infected when he saw them would be the group that would have more tuberculosis later on, because they were exposed to tuberculosis. I should like to ask him how much precaution was taken to prevent reexposure or reinfection in those positive

children. Any immunity that goes with tuberculosis is only relative. That can be overcome if a subsequent reinfection is sufficiently severe. It is my opinion that many persons have tubercle bacilli taken into their bodies, probably many times, without ever showing any manifestation of that reinfection.

DR. W. AMBROSE MCGEE, Richmond, Va.: Dr. Myers' study represents a large number of children observed over a long period of years. His ideas are more or less unusual and his excellent work should stimulate others either to prove or to disprove his conclusions. I am glad to hear Dr. Myers say that he has discarded the Pirquet tuberculin test in favor of the intradermal or Mantoux test. Contrary to some opinions, the intradermal test is usually positive even in such overwhelming infections as tuberculous meningitis. A practical and economical idea advanced by Dr. Myers is that the roentgen examination in children with negative tuberculin tests is not necessary. In those with positive tuberculin tests of the first type of infection also he has found the x-rays of little necessity. A few months ago I was able to make a comparative study of the Schilling differential count and sedimentation test in a few children with various stages of tuberculosis, from suspected cases to far advanced adult type. All of the children, of course, had positive tuberculin tests. The summary of the small material collected was that in cases of tuberculosis in which activity was apparent or far advanced the two tests paralleled each other, but in those of very slight activity or in the group observed as suspected tuberculosis the Schilling differential count was by far the better and was much more practical for children and more sensitive to even slight physical changes. If that test was used in a routine way by a competent hematologist it might aid one in dividing those children who have positive tuberculin tests in the first type of infection into two groups, those that by clinical observation and the Schilling differential fail to show evidence of any infection, and those that show some evidence of possible latent infection. From a broad view of allergy, it seems reasonable to feel theoretically that a first infection makes the child more prone to sensitiveness to the tuberculoprotein. The occurrence of only one reinfectious type of pulmonary tuberculosis in 2,306 cases certainly shows the low incidence in children who come within the age limits of pediatricians. The common idea that it was good for a child to receive a small dose of tubercle bacilli has certainly received a jolt, judging from Dr. Myers' observations. His conclusion that in reexamining tuberculous skin tested children the prognosis is much poorer when they had previously given a positive reaction appears in keeping with his statistics. If this finding is substantiated by subsequent observers, children with positive skin tests will have to be regarded as a double health liability. The children studied by Dr. Myers may have come from homes where tuberculosis was prevalent. If this is true, I wonder whether he has made a study of another group of children from surroundings more or less free from tuberculosis.

DR. J. A. MYERS, Minneapolis: In each case an attempt has been made to break contact just as soon as possible by isolating the parent or other source of infection. That is, an attempt is made to protect the child against subsequent exposure in every possible way. Of course, I have not succeeded in all cases. There is the occasional patient who absolutely refuses to protect the children and other members of the family. I have not questioned the statement that some immunity develops. I think its presence has been proved conclusively by a number of experimental workers. However, the allergy that nearly always develops is the dangerous factor, as it allows destruction to occur in the presence of immunity. I am inclined to believe from my observations that at least 10 to 20 per cent of children with positive tuberculin reactions at some time during life will suffer or die from clinical tuberculosis, for already more than 9 per cent of the positive reactors traced among the first 1,000 children examined have fallen ill, and several of them have died. It must be kept in mind that the average age of this group now is only 20.8 years, and that the peak of tuberculosis mortality is not reached in this country until about 25 years and that it remains high; in fact, it is the first cause of death in this country until about the forty-fifth year. Therefore, a good many years remain during which more children may fall ill with clinical tuberculosis.

Clinical Notes, Suggestions and New Instruments

THE BARBITURATES A SAFE PRELIMINARY MEDICATION FOR SURGICAL OPERATIONS

JAMES T. GWATHMEY, M.D., NEW YORK

Evidence that the barbiturates antagonize the toxic effects of procaine, both in the laboratory and in the clinic, indicates their preliminary medication for local and spinal anesthesia. The use of a preoperative barbiturate reduces the postoperative use of morphine by 28 per cent and vomiting by 15 per cent, as compared to the usual morphine preliminary, which requires 82 per cent postoperative morphine with 60 per cent vomiting.[1]

Exactly which barbiturate is best or whether any of the barbiturates is better than the original barbital is, as yet, undecided. Theoretically, that particular barbiturate would be best which is most analgesic and is followed by the least nausea and vomiting. For children and also in obstetrics, nembutal is decidedly superior to any other barbiturate.

As a general proposition, all anesthesias should be so heavily premedicated (i. e., patient asleep) that the terminal anesthetic should never have to be pushed. The inhalation anesthetic should be supplementary to the preliminary medication, as this procedure reduces the amount of the inhalation anesthetic used and allows an increase in the oxygen, with pulse, respiration and blood pressure more normal than when any inhalation anesthetic is used without preliminary medication. Preliminary medication banishes fear and anxiety, thus conserving energy. Hooper and Gwathmey have shown that lung lesions occur with all inhalation anesthetics in laboratory animals not given a preliminary but do not occur when medicated.[2]

For these reasons, I have been using for some time for preliminary medication some one of the barbiturates. For the past two years I have been using sodium ipral. This is efficient in producing a quiet sleep, either before an inhalation or oil-ether colonic anesthesia. This special barbiturate seems to be unusually safe, as the following case will show:

A bottle of sodium ipral (the sodium salt of ethylisopropylbarbituric acid) containing forty-six tablets[3] of 4 grains (0.26 Gm.) each was given to a nurse with directions to give three tablets to a patient (the usual dose) one hour before operation. This was done and the patient was asleep at the time of operation. Later, before returning the bottle, the nurse, in a despondent mood, on Monday, April 4, 1932, at 9:30 p. m., took forty-three tablets (4 grains each, 172 grains, or in all 11 Gm.) of sodium ipral, one at a time, with a swallow of water, using a glassful of water altogether. The tablets were taken as rapidly as possible in an estimated total time of fifteen minutes. Previously, at irregular intervals, the nurse had taken one tablet for insomnia and found that this produced a sleep of six hours with no after effect, but she had not formed a habit for the drug. The forty-three tablets did not seem to the nurse to put her to sleep quicker than the one tablet on previous occasions. She went to sleep in about the same way and time as with one. No throbbing of the heart or unpleasant sensation occurred.

She was discovered by friends the following day, April 5, at 1 p. m., sixteen hours after she had taken the 172 grains. Three tablets (12 grains, 0.8 Gm.) is the maximum dose as a basal induction anesthetic. Bernard Fantus states that the fatal dose of the barbiturates is from "fifteen to thirty times the therapeutic dose." Fifteen times three (the therapeutic dose) would be forty-five tablets, so forty-three tablets would not be a fatal dose, although the patient had every reason to believe it would be; i. e., the observation of the effects of three tablets on different patients. The fatal dose of Sodipral is unknown at this time.

I was called in consultation by the attending physician, as I had given the nurse the bottle of tablets. The stomach was washed out at 1:30 with warm water very thoroughly; respira-

1. Bartlett, Willard: Personal communication to the author; Surg., Gynec. & Obst. **50**: 775 (April) 1930; **51**: 217 (Aug.) 1930.
2. Nelson's Looseleaf Surgery **1**: 514, 515.
3. A full bottle contains fifty tablets. I had used four tablets before giving the bottle to the nurse.

tion was considerably improved, although slightly labored but deep. The pulse was 84. The lid reflex was quite active. The color was good. She was now removed to Bellevue Hospital and sent to the emergency ward.

On admission, the pulse was 80. The temperature was 97 F. and rose to 103 the third day in the hospital but fell to nearly normal in a few days, with slight fluctuations afterward. The treatment following her admission and during the period of her unconsciousness consisted of colon irrigation, clysis, coffee enemas, and caffeine sodiobenzoate, 7 grains (0.46 Gm.) every four hours. The treatment followed precisely that outlined by Fantus.[4] She regained consciousness the morning of April 9, four days after her admission to the hospital and five days after taking the forty-three tablets (172 grains).

The patient resumed nursing one month after her dismissal from the hospital. It is now over a year since this occurred. A thorough examination by her physician indicates no pathologic changes and, to all outward appearances, she is in perfect strength and health, and, best of all, has a cheerful and contented disposition.

133 East Fifty-Eighth Street.

Therapeutics

THE THERAPY OF THE COOK COUNTY HOSPITAL

EDITED BY BERNARD FANTUS, M.D.
CHICAGO

NOTE.—*In their elaboration, these articles are submitted to the members of the attending staff of the Cook County Hospital by the director of therapeutics, Dr. Bernard Fantus. The views expressed by various members are incorporated in the final draft for publication. The series of articles will be continued from time to time in these columns.*—ED.

THERAPY OF GLAUCOMA

OUTLINE BY SANFORD R. GIFFORD, M.D.

Definition.—A sufficient increase in intra-ocular tension to damage the contents of the eyeball. Differentiation must be made between (*a*) Acute primary glaucoma, (*b*) chronic primary glaucoma, (*c*) secondary glaucoma and (*d*) absolute glaucoma.

Diagnosis.—The tonometer and the perimeter must be used as a routine whenever there is even a suspicion of glaucoma, which arises when in a person over 40 years of age there occurs a sudden failure in the amplitude of accommodation, a temporary loss of some or all vision, hazy or foggy vision, or the appearance of colored halos around artificial lights. In the normal eye the tension is between 15 and 25 mm. of mercury as measured by the tonometer (Schiötz).

ACUTE GLAUCOMA

Acute glaucoma is an emergency condition, most commonly arising during the latter part of the night with severe pain in the head, possibly nausea and vomiting, conjunctival congestion, "steamy" and anesthetic cornea, dilated and immobile pupil, discolored iris, rapid loss of vision, and hardness of the eyeball. Tonometric measurement should be taken at once and repeated at intervals to observe the effect of treatment. The patient should be hospitalized as soon as possible.

For differentiation from acute iritis, see "Therapy of Iritis."

Treatment aims at reduction of the intra-ocular tension to normal. This may be secured by:

1. *Miotics.* — Physostigmine Salicylate (1 per cent solution, prescription 1) should be instilled at once into the affected eye several times at intervals of a minute and then at half hour intervals. Morphine sulphate, 0.015 Gm., is injected hypodermically as soon as possible, for it at one and the same time increases the effect of the miotic and relieves pain.

PRESCRIPTION 1.—*Physostigmine Eye Drops*

℞ Physostigmine salicylate ..... 0.10 Gm.
Saturated solution of boric acid..... 10.00 cc.

M. Label: One to two drops in eye every minute several times, then at half hour intervals (in acute glaucoma). This solution does not keep well; when it becomes pink or red it should be discarded.

2. *Saline Purgative.* — Also magnesium sulphate, 30 Gm. in concentrated solution (60 cc. of water), should be given at once.

3. *Hypertonic Dextrose Phleboclysis.* — The slow intravenous injection of from 250 to 500 cc. of 25 per cent dextrose solution should be instituted at once after admission of the patient to the hospital. Unless the tension subsides to the normal within a few hours, the patient should be taken to the operating room and receive a retrobulbar injection of procaine-epinephrine.

4. *Procaine-Epinephrine Retrobulbar Injection.*—To the syringe containing 1.5 cc. of a 4 per cent solution of procaine one adds 0.25 cc. of the Solution of Epinephrine and retrobulbar injection is performed, after preliminary application to the conjunctiva of 2 per cent butyn solution. It is not uncommon to find, ten or fifteen minutes after such an injection, the tension reduced by 10 to 20 mm., or even to normal. At the same time, good local anesthesia has been secured by it. Preoperative drastic reduction of intra-ocular tension is highly desirable to lessen the chance of hemorrhage following operation on the eye.

5. *Surgical Decompression.*—(*a*) Iridectomy: The eye should be held in downward rotation either by toothed fixation forceps which grasp the tendon of the superior rectus through the conjunctiva or else by a thread placed through this tendon. Incision is made with the keratome from 0.5 to 1 mm. back of the sclerocorneal junction, the blade being parallel with the iris surface. An incision 4 mm. long is sufficient. A small conjunctival flap may be made by picking up the conjunctiva with the point of the keratome before it is inserted, or a larger one by previous dissection with scissors. The iris is grasped at the pupillary border and drawn out of the wound. A radial cut is made in the iris at one side of the forceps. Then by gentle traction the iris root is separated from its attachment over an extent of 20 degrees. A second radial cut completes the iridectomy. The cut edges are replaced and the conjunctival flap is smoothed out with the spatula. One or two stitches in the conjunctival flap may be employed. The eye should be protected by a dressing and a rigid shield for a week.

(*b*) Paracentesis of the Eyeball: This procedure may be successful in aborting an acute attack when operation is impossible or must be delayed too long for safety. This simple paracentesis may be done at home and in the patient's bed with no other equipment than a syringe of 2 per cent cocaine solution, a speculum, fixation forceps and a small, sharp cataract knife. After physostigmine has been pushed for an hour, a marginal paracentesis is done and the physostigmine continued.

4. Fantus, Bernard: The Therapy of the Cook County Hospital: Barbiturate Poisoning, J. A. M. A. **103**: 749 (Sept. 8) 1934.

CHRONIC GLAUCOMA

Chronic glaucoma may have no other subjective symptoms than a gradual loss of vision and contraction of the visual fields. There may be intermittent pain in one or both eyes, but this is often absent. Ophthalmoscopic examination shows cupping of the disks, and examination with the tonometer reveals a definite, but not extreme, increase in intra-ocular tension (from 30 to 45 mm. Schiötz).

1. *Miotics.*—These are successful in most cases in reducing tension to normal for a time. In a certain number of cases this effect may continue indefinitely. It is important, however, to check progress in each case by frequent field determinations and to remember that the tension varies during the day in glaucoma patients, so that one whose tension is always normal when seen in the office may have a higher tension at other times, especially during the night, which will cause gradual deterioration of the fields. Tension should therefore be taken at various times of the day and especially early in the morning before any miotics have been used. The danger of miotics is of overconfidence in their effect, and a patient using them must be under constant surveillance.

PRESCRIPTION 2.—*Pilocarpine Eye Drops*

℞ Pilocarpine nitrate ..... 0.10 Gm.
Boric acid ..... 0.20 Gm.
Distilled water.....to make 10.00 cc.
M. Label: Drop into eye from one to five times daily (in chronic glaucoma).

PRESCRIPTION 3.—*Pilocarpine Eye Salve*

℞ Pilocarpine nitrate ..... 0.20 Gm.
Distilled water ..... 1.00 cc.
Hydrous wool fat..... 2.00 Gm.
White petrolatum ..... 7.00 Gm.
Mix with careful trituration and dispense in collapsible tube with eye tip.
Label: Apply to affected eye at bedtime (in chronic glaucoma). If collapsible eye ointment tube is not available, a glass rod may be used to apply salve to lower lid, which is then permitted to close. Gentle massage of lids helps to distribute ointment over the conjunctiva.

(*a*) Physostigmine 0.2 per cent (prescription 1, with reduction of alkaloid to 0.02 Gm. to each 10 cc.), or

(*b*) Pilocarpine 1 per cent solution (prescription 2); nitrate is preferable to hydrochloride, which is very deliquescent. Boric acid may be added for isotonicity and preservation of solution. Because of nocturnal tendency to rise of tension, an eye salve (prescription 3), which has a more enduring action, is preferable at bedtime.

2. *Epinephrine.*—Of the Solution of Epinephrine, about four drops is placed on a cotton pledget under the upper fold of the conjunctiva for four minutes. This may be useful in cases that are almost but not quite controlled by miotics. As there is some danger of an acute rise of tension caused by the epinephrine mydriasis, one should always precede it by a drop of 0.2 per cent physostigmine solution instilled three times at ten minute intervals and then every half hour for the next two hours or long enough to keep mydriasis from occurring, the danger of which is over in from six to eight hours. Miotics are then continued and tension may remain normal for longer than a week, in some cases for longer than a month. A number of cases may be kept under control for from eight to twelve months by repetition of the treatments, but in many cases later treatments are less effective and most cases finally come to operation. A few cases are unaffected by epinephrine and, when one attempt has failed, nothing is to be gained by further attempts. Epinephrine is contraindicated in types of glaucoma accompanied by inflammation. In glaucoma following cataract operation or discission, however, the same objection does not seem to hold; and in a number of such cases it has controlled the tension until normal drainage has been reestablished without operative intervention.

3. *"Salt Free and Acid Ash" Diet.*—Elimination of sodium chloride from the diet, with the substitution of potassium chloride used freely as table salt, with a diet designed to have an acid ash, may cause edematous tissues to give up water in a manner sometimes surprising. Ammonium chloride is also given in doses of 6 Gm. a day to lessen further the alkali reserve. This plan may be carried out in those cases of chronic glaucoma in which the tension hovers slightly above normal in spite of miotics, as it may reduce tension to normal.

4. *Surgery.*—When the use of miotics and the general measures that have been mentioned fail to control tension and fields, one should employ operation. More harm is done in glaucoma by delaying surgery than by operations even when improperly performed. A filtering operation is the only form of procedure that offers an excellent chance of permanently reducing tension. Whether one chooses corneoscleral trephining, sclerectoiridectomy according to Lagrange, or iridencleisis will depend on one's training, but every ophthalmologist should be the master of at least one of these three procedures. Iridencleisis has the advantage of being less liable to certain well known complications than trephining. It is so much easier to perform that it should commend itself to the surgeon of limited surgical material. It seems ideal in buphthalmos. In cases of chronic glaucoma presenting a tension above 45 to 50 in spite of miotics, a recurrence of tension is more likely than after corneoscleral trephining and the latter procedure is to be preferred in such cases.

(*a*) Trephining: Fixation on the superior rectus is secured as for iridectomy. A large thin flap of conjunctiva is carried to the margin of the cornea and, if possible, a little beyond. This necessitates slight splitting of the corneal fibers. By means of a trephine, 1.5 mm. in diameter, an opening is made into the anterior chamber at the sclerocorneal junction and a bit of the iris is excised as it presents in the wound. The conjunctival wound is sutured.

(*b*) Sclerecto-Iridectomy: In this procedure, fixation and the preparation of a large conjunctival flap are the same as for trephining. Here the cornea is not split. The incision is made with a narrow Graefe knife, which cuts the sclera obliquely so as to come out 2 mm. behind the limbus, leaving a tongue of sclera. This is cut off with full curved scissors or a special punch. Iridectomy is performed, usually including a full sector of iris, and the conjunctival flap is carefully replaced.

(*c*) Iridencleisis: Fixation is done and a conjunctival flap made as for sclerecto-iridectomy. An incision 4 mm. long is made with the keratome 1 mm. back of the limbus. The iris is drawn out and one radial cut is made in the pupillary border. The piece of iris grasped by the forceps is allowed to remain out beneath the conjunctival flap, the inner pigmented side being turned outside. The straight conjunctival incision is closed with a running suture. (Another form of iris inclusion operation, "iridotasis," is similar to the foregoing except that the iris is not cut, the pupillary border being left out under the conjunctival flap.)

SECONDARY GLAUCOMA

One speaks of primary glaucoma when no signs of previous inflammation or other pathologic changes are seen in the eye, and of secondary glaucoma when signs

of inflammation are found or when a dislocated lens, tumor, anterior synechia or other definite cause is present.

1. Whenever systemic infection can be demonstrated, whether it is "rheumatic," tuberculous or syphilitic, it should receive appropriate treatment alongside the therapy dictated by the dangerous rise of intra-ocular tension. Eradication of foci of infection is usually so disappointing in chronic glaucoma that only very obvious foci, such as dental root abscesses, should be taken care of. Mere suspicion is no indication here for removal of teeth or tonsils.

2. In iritis (q. v.) with secondary rise of tension, treatment with salicylate and foreign protein injections and elimination of the cause should form the background of the therapy, while the intra-ocular tension is kept within safe limits until the inflammation is controlled. As miotics are usually contraindicated in iritis, this may possibly be accomplished by ergotamine tartrate (gynergen), 0.25 mg. of which (one-half ampule) injected subcutaneously twice daily may succeed in reducing the pressure to the requisite degree. The effect must be carefully observed, as in certain cases it proves absolutely ineffective. Paracentesis, repeated after several days if necessary, is a safe and effective means of controlling tension for the brief period until treatment of the inflammation has become effective.

3. In cataract operation or discission, followed by glaucoma, epinephrine may prove of great value. Atropine should be avoided, Homatropine being used when mydriasis seems absolutely necessary. When the glaucoma resists this treatment, cyclodialysis is the operation of choice.

ABSOLUTE GLAUCOMA

When, possibly because of neglect of appropriate treatment, the eye has become stony hard, its sight lost, and it is a constant source of pain to the patient, enucleation of the eyeball is called for.

Committee on Foods

THE COMMITTEE HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. RAYMOND HERTWIG, Secretary.

NOT ACCEPTABLE

SOUTHERN DAIRIES CREAMED BUTTERMILK WITH 150 VITAMIN D UNITS (STEENBOCK) (400 UNITS U. S. P.) ADDED PER QUART

The Southern Dairies, Inc., Asheville, N. C., submitted to the Committee on Foods a bottled pasteurized whole milk inoculated with a lactic acid producing culture, fortified with vitamin D (vitamin D concentrate prepared from cod liver oil) called "Southern Dairies Creamed Buttermilk with 150 Vitamin D Units (Steenbock) Added per Quart."

Analysis (submitted by distributor).—

Milk fat not less than 3.8 per cent.
Acidity as lactic acid 0.9 per cent.

Discussion of Name, Label and Product.—The name "Creamed Buttermilk" for a whole milk inoculated with a lactic acid producing culture misinforms the purchaser as to the true nature of the food. It is not a buttermilk with added cream as indicated. An appropriate name is "Lactic Acid Milk (Cultured)." Descriptive food names should be correctly informative and not misleading in any particular.

The label states the vitamin D content of the product but not the source of the vitamin. Since vitamin D from different sources may have unlike nutritional values, the label should declare that the vitamin D was obtained from cod liver oil. No report of clinical studies on the human antirachitic value of this vitamin D fortified product was furnished. Without such studies, there can be no sound evidence on which to base any antirachitic advertising claims.

The distributor was advised of the recommendations and criticisms of the Committee but is unwilling to take action to correct the name and label, or determine the human antirachitic value of the food. This product will therefore not be listed among the Committee's accepted foods.

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

DAWN FRESH MUSHROOMS
FANCY BUTTONS—PIECES AND STEMS—SLICED

Packer.—Michigan Mushroom Co., Niles, Mich.

Description.—Cooked mushrooms, whole, sliced, or pieces and stems, with added water, salt and citric acid (U. S. P.); the same as Excelsa Mushrooms, Fancy Buttons, Pieces and Stems, and Sliced (THE JOURNAL, Aug. 4, 1934, p. 342).

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(1) LIBBY'S PETER PAN UNSWEETENED EVAPORATED MILK
(2) COMET UNSWEETENED EVAPORATED MILK
(3) TARGET UNSWEETENED EVAPORATED MILK

Distributors.—(1) Libby, McNeill and Libby, Chicago, and (2) and (3) Union Condensed Milk Company, Chicago.

Packer.—Libby, McNeill and Libby, Chicago.

Description.—Unsweetened, sterilized evaporated milk, the same as Libby's Sterilized Unsweetened Evaporated Milk (THE JOURNAL, June 13, 1931, p. 2037).

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(1) HEBE STERILIZED UNSWEETENED EVAPORATED MILK
(2) MT. VERNON STERILIZED UNSWEETENED EVAPORATED MILK

Manufacturers.—(1) Hebe Company, Milwaukee and Seattle, and (2) Mt. Vernon Milk Company, Seattle, subsidiaries of the Carnation Company, Oconomowoc, Wis.

Description.—Unsweetened, sterilized evaporated milk, the same as Carnation Sterilized, Unsweetened Evaporated Milk (THE JOURNAL, June 14, 1930, p. 1919).

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(1) QUAKER BRAND UNSWEETENED BAKING CHOCOLATE
(2) NARRAGANSETT BRAND COOKING CHOCOLATE UNSWEETENED

Distributors.—(1) Lee & Cady, Detroit, and (2) Narragansett Wholesale Grocery Co., Providence, R. I.

Packer.—Moffat, Inc., Boston.

Description.—Ground cacao nibs or "chocolate liquor" in cake form. Same as Moffat Cooking Chocolate Unsweetened (THE JOURNAL, Jan. 20, 1934, p. 213).

Claims of Manufacturer.—Conforms to the United States Department of Agriculture definition and standard.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, NOVEMBER 17, 1934

UTILIZATION OF VITAMIN A AND CAROTENE

Among students of metabolism it is an axiom that food materials or therapeutic substances are not effectively in the body until they have passed from the gastro-intestinal tract into the blood or lymph. Many factors ordinarily exert an influence on materials in the intestinal tract, and absorption and subsequent utilization are to a great extent dependent on them. The action of the digestive enzymes is, in the main, looked on as a sine qua non to normal nutrition; yet hydrolysis by the proteases frustrates the oral administration of insulin. In the presence of acid the absorption of calcium is favored, whereas an alkaline reaction in the intestine tends to precipitate calcium not only as the phosphate but also as insoluble soaps of the fatty acids of the food, thus doubly robbing the body of dietary essentials. In the opinion of certain students of the subject, the hypothesis that beriberi is of infectious origin rather than caused by a deficiency of vitamin B can be disposed of by pointing out that gastro-intestinal disturbances themselves infectious prevent the usual absorption of foods containing vitamin B, thus obscuring the real cause of the disease. Again, it has been shown [1] that in the absence of bile from the intestine there is apparent difficulty in the absorption of vitamin D. In rachitic animals with obstructive jaundice, cod liver oil fails to promote calcification.

In a recent study, Dutcher and his associates [2] have added to the foregoing thesis in considerable detail. In an attempt to elucidate the reported difference between the utilization of vitamin A from butter and that from cod liver oil in the presence of liquid petrolatum, they studied the behavior of the pigment carotene under similar circumstances. Groups of experimental animals were given adjusted quantities of liquid petrolatum together with various amounts of butter fat, carotene, cod liver oil and an extremely potent concentrate of cod liver oil. When cod liver oil was given in minimal quantity together with a relatively large amount of liquid petrolatum, utilization of the vitamin A was inhibited; however, increasing the amount of cod liver oil led to favorable results. The potent concentrate of cod liver oil was well utilized despite the liquid petrolatum. When butter was the source of the vitamin A potency, liquid petrolatum exerted a retarding influence on its absorption to an appreciable extent. With the pigment carotene providing the sole source of vitamin A, there was a marked retarding effect on its utilization. These observations are generally in accord with other observations [3] made under somewhat different conditions.

In an effort to determine the mechanism whereby the utilization of carotene is prevented by liquid petrolatum, an antioxidant was added. The results indicated that there was no destruction of the pigment by oxidants in the liquid petrolatum. By careful extraction of the feces of the experimental animals to which liquid petrolatum and carotene had been fed, the pigment was recovered, indicating that the utilization of carotene was almost completely prevented by the liquid petrolatum. In like manner it was demonstrated that the vitamin A concentrate did not appear in the feces.

The investigation just described clarifies a confused situation. There is little doubt that vitamin A can be absorbed from the intestine despite the presence of liquid petrolatum. On the contrary, the pigment carotene, which usually accounts for the vitamin A potency in plants and plant products and which in the animal body is transformed to vitamin A itself, is absorbed from a solution in liquid petrolatum to little if any extent. The previous confusion with reference to butter arises from the fact that both carotene and vitamin A occur in butter and the relative quantities vary.[4] Liquid petrolatum will therefore vary in its effect on different samples of butter. The action of liquid petrolatum on carotene is merely one of preferential solvent; the pigment is apparently more soluble in the liquid petrolatum than in the lipides of the intestinal and pancreatic juices or the lipides of the food residues.

These studies emphasize the unique contrast in external behavior between two structurally related compounds which, once they are inside the body, behave identically. They should also help to clarify the status of liquid petrolatum, which has had a considerable vogue among physicians as a therapeutic agent. In practice, as has been pointed out,[5] the usual manner of taking liquid petrolatum, i. e., apart from a meal, virtually eliminates the danger of loss of vitamin A or its precursor (carotene) by the mechanism here discussed.

1. Greaves, J. D., and Schmidt, C. L. A.: Univ. California Pub. Physiol. **8**: 43, 49, 1934.
2. Dutcher, R. A.; Harris, P. L.; Hartzler, E. R., and Guerrant, N. B.: J. Nutrition **8**: 269 (Sept.) 1934.
3. Rowntree, J. I.: J. Nutrition **3**: 345 (Jan.) 1931. Jackson, R. W.: Nutrition **4**: 171 (July) 1931; **7**: 607 (June) 1934.
4. Baumann, C. A.; Steenbock, Harvey; Beeson, W. M., and Rupel, I. M.: J. Biol. Chem. **105**: 167 (April) 1934.
5. Jackson.[3]

CHIROPRACTORS AND NATUROPATHS DEFEATED

Chiropractic and naturopathy received a noteworthy setback, November 6, when the people of Arizona, California and Oregon decisively defeated at the polls measures for the aggrandizement of those cults submitted under the initiative system of legislation.

In Arizona the naturopaths wanted an independent naturopathic examining and licensing board. They wished to have naturopaths exempted from the requirements of the basic science law and authority for every licensed naturopath to exercise every right and privilege given by law to any practitioner of the healing art.

In California a schism in the chiropractors of the state sought by an initiative measure to add to chiropractic prerogatives a monopoly of the right to practice physical therapy, by providing for the issue to licensed chiropractors only of licenses to practice physical therapy, authorizing the holders "to practice obstetrics; to use, prescribe and practice prophylactic hygiene and sanitation and dietetics, including, in any form, herbs, oils and all animal and vegetable foods; and to use all systems, methods or instruments in diagnosis, including the use of roentgen rays." Under the chiropractic initiative all licensed chiropractors in the state were to constitute a public corporation, with officers elected by the members, with power to regulate chiropractic practice, to levy dues on its members and to discipline its members. The dominant group of chiropractors in the state publicly denounced the measure, saying that the chiropractic initiative measure of 1922 had vested in them all authority necessary to enable them to practice legitimate chiropractic. Another California naturopathic initiative sought to establish naturopathy by law as a distinct school of healing, with its own independent examining and licensing board. It proposed to organize all licensed naturopaths in the state into a self-governing public corporation. Naturopathy was defined by the measure as including "physiotherapy, physical therapy, phytotherapy, biochemistry, the use of antiseptics, anesthetics, applied therapeutics and prophylactic hygiene and sanitation; the science and art of diagnosis, which enables the naturopathic physician to direct, advise, prescribe, dispense or apply food, water, roots, herbs, plants, oils, lights, heat, color, exercises, active and passive, manipulations, correcting vital tissue, organs or anatomical structures by manual, mechanical or electrical treatment, instruments and appliances, x-ray, or any and all other natural agencies that have been used in the past, that are now in use, or that may be used in the future, to assist nature in restoring a physiological and psychological interfunction for the purpose of restoring and maintaining a normal state of health, mentally and physically."

In Oregon, chiropractors and naturopaths already have their independent examining and licensing boards. A basic science law that went into effect Jan. 1, 1933, however, seems to have given alarm to chiropractors and naturopaths generally, and particularly to a struggling chiropractic school in the state, whose graduates, under the basic science law, were threatened with the necessity of having to show that they had been adequately instructed in anatomy, physiology, chemistry, pathology and hygiene, before an independent board, before they could appear before the chiropractic board for examination. The chiropractors of the state therefore combined with the naturopaths in proposing as an initiative measure an amendment to the state constitution that would have abolished the examinations in the basic sciences under the basic science law. The measure was so worded as to permit the governing board of the chiropractic and naturopathic bodies to enlarge the scope of practice of their adherents in such a way as to permit them to use drugs and possibly even to enter into the general practice of obstetrics and surgery.

Through the effective work of the state medical associations of Arizona, California and Oregon, and with the aid of many public spirited citizens both individually and in organizations, the people of these states were kept informed as to the dangers threatened by the proposed initiative measures. As has been mentioned, decisive defeats resulted in each state. The people of Arizona, California and Oregon are to be congratulated on maintaining their standards of medical care. Apparently the majority of the voters recognized the necessity for protection against ignorance, superstition and incompetence in medical care.

RAMÓN Y CAJAL

Spain's great medical scientist Ramón y Cajal has died, leaving an illustrious group of students to carry on in the Instituto Cajal in Madrid. Born in an isolated mountain village, Cajal inherited a strong will from his father, who was a surgeon, and a talent for art, music and philosophy. Too early the father showed a determination to develop in the son a talent for medicine, and in several attempts under coercion the young son did not succeed. A love for drawing and painting occupied much of his time, yet in school his teachers declared that his drawings had little merit. They found him indifferent and said that he had no memory. Twice he was removed from school altogether and apprenticed to a barber and a cobbler. Then he became absorbed in painting and in the perusal of novels. The despairing father again undertook to start Ramón on the way to a medical career, teaching him osteology. The artist in young Ramón took to making pictures of bones from every angle and at last he became a skilled anatomist. To these modest lessons on human bones Cajal attributes his ultimate development into a morphologist. He then went to Zaragoza in Aragon, where the father had been appointed professor of anatomy in the university and Ramón, without any indications of brilliance, obtained a medical degree in

1873. As a student at Zaragoza, he acquired a mania for gymnastics, developing his own exercises, to which he devoted much time. His physical prowess, no doubt, helped him gain admittance to the medical corps of the Spanish army and he sailed for service in Cuba in 1874, to be assigned to an isolated infirmary at Vista Hermosa, where he soon acquired malaria and dysentery. Cajal was very sick when his resignation was accepted in 1875 but he arrived home in Zaragoza improved by the voyage and went to Madrid to be examined for a doctorate. There he first saw a microscope. He was appointed in turn an assistant demonstrator at the University of Zaragoza, to the chair of anatomy and as director of the anatomic museum. He developed pulmonary tuberculosis, which necessitated living outdoors most of the year 1878, and in 1879, against the advice of friends, he married on a small salary. Garrison's translation of Cajal's account of meeting his future wife illustrates his simplicity and candor:

> Returning one evening from a walk to Torrero, I encountered a young girl of modest appearance, accompanied by her mother. Her blushing, springlike face suggested Raphael's madonnas or, better still, a German colored engraving of Marguerite in Faust. Attracted no doubt by the sweet, pleasant disposition apparent in her features, her slender figure, her large green eyes veiled by long lashes, her abundant hair, I was even more impressed by the air of childlike innocence and melancholy resignation which emanated from her whole being. Unseen, I followed the young girl to her home, learned that she was the orphaned daughter of a modest employee and enjoyed a reputation for honor, modesty and domestic tastes. I made her acquaintance and after a time, against the collective advice of my family, married her, not without due consideration of the mental characteristics of my fiancée, which were complementary to my own. My resolution was discussed by acquaintances in clubs and cafés as an act of madness: Poor Ramón is lost forever. Goodbye to study, science and general ambitions. . . . And yet, although eulogies do not flow readily from my pen, I take pleasure in saying that, with beauty which seemed predestined to shine in promenades, visits and receptions, my wife cheerfully condemned herself to the obscurity of my lot, remaining simple in her tastes and with no other aspirations than tranquil contentment, order and system in the management of the home, and the happiness of her husband and children.

In 1884 Cajal accepted the chair of anatomy at Valencia, where an epidemic of cholera developed the next year. He was the first in Spain to establish by a staining method of his own the relation of the comma bacillus to cholera. He was presented with a fine microscope by the Central Committee, and with it he began to investigate the degenerative processes in the protoplasm of the comma bacillus. Now at the age of 32, he fitted up a small laboratory in his home and added to his meager salary by coaching graduate students. A neuropsychiatrist of Madrid, Dr. Luis Simarra, told Cajal of Golgi's chrome silver stain, which method Cajal improved and applied to the entire nervous system. His study of the histology of the nervous system really began in 1887 with his transfer to the chair of anatomy at the University of Barcelona, where he began to publish his microscopic studies and then to send communications to foreign journals. He was invited to discuss his work before the members of the German Anatomic Society in Berlin in 1889. They were skeptical at first, but after Cajal's demonstration of beautiful preparations of axons of granule cells of the cerebellum, of the bifurcations and ascending and descending branches of the sensory spinal roots, and of the long and short collaterals of the tracts of the white substance and of the terminations of the retinal fibers in the optic lobes, Kölliker, the patriarch of German histology, introduced him to many notable German histologists and embryologists and returned to Würzburg to try out Cajal's methods. Kölliker was able to substantiate Cajal's work. Having established a wide reputation, he was invited to become a professor at the University of Madrid in 1892, where he undertook arduous investigation incompatible with the social distractions of Madrid. In 1894 Cajal delivered the Croonian lecture before the Royal Society of London, and honorary degrees were conferred on him by Oxford and Cambridge. Although his country had just been at war with the United States, he was invited in 1899 to Clark University for the decennial celebration, where he gave three lectures on "The Comparative Study of the Sensory Areas of the Human Cortex." These lectures are important contributions to the subject. At this time, Garrison[1] says, Cajal was a handsome figure with the abstract mien of a laboratory worker, in the prime of life and of international reputation. The scientific world now acclaimed him. Cajal had already gained the Rubio, Fauvelle and Martinez Molina prizes. He was awarded the Moscow prize at the International Congress of Medicine in Paris in 1900, and in 1904 the Helmholtz medal of the Royal Prussian Academy. In 1906 Cajal was summoned to Stockholm to receive the Nobel prize, conjointly with Golgi. The subject of his address on this occasion was "Structures et connexions des neurones." Although now at the pinnacle of scientific recognition, his life work was only well begun. Cajal advanced now, Addison[2] says, from methods for demonstrating the neurofibrils within the neurons into new methods for showing the structure of the neuroglia more definitely. His pupils, among whom have been such men as Nicolas Achucarro, Pio del Rio Hortega, Francisco Tello, de Castro, Villaverde, Sanchez and Llorente de No, have exhibited great enthusiasm. The Spanish School of Neurohistology has contributed as much to the knowledge of the neuroglia as of the neurons. In 1906 Spain offered Cajal the ministry of public instruction, which was declined. In 1913-1914 he published his great work on degeneration and regeneration of the nervous system. Garrison has listed chronologically, beginning in 1880, the scientific achievements of Cajal.

1. Garrison, F. H.: Ramon y Cajal, Bull. New York Acad. Med. 5: 483 (June) 1929.
2. Addison, W. H. F.: Ramon y Cajal—An Appreciation, Scient. Monthly, August 1930, p. 178.

His masterpieces are his encyclopedic treatises on neurohistology (1897-1904) and on degeneration and regeneration in the nervous system (1913-1914). His actual contribution is the ultimate developmental and structural basis of the dynamics of the neuron, of transmission of impulse, of localization of function, and of degeneration and regeneration of the neurons and axons of the nervous centers.

Cajal the philosopher is at his best in Chácharas de Café, a series of aphorisms and anecdotes to which editorial notice was given in THE JOURNAL [3] in 1921, and in which he said:

Every gratuitous burden of responsibility is essentially immoral.

A woman venerates her parents, esteems her husband but adores only her sons.

When I clapped for the waiter in a café, it was greeted by the wretched pianist as applause.

We disdain and hate from lack of self comprehension and we understand in proportion as we study ourselves.

Try to honor your children lest they dishonor you.

Those who have not been a little wild in youth are in danger of being so in age, excepting always the mentally defective, the weak willed and the prematurely old.

The highest happiness almost always coincides with forgetfulness of ourselves and of others. This beatific alienation of frivolous or disagreeable things is attained when we ask our servant: Have I eaten?—an unequivocal criterion of vocation.

Do you wish to be invisible to men? Be poor. To women? Be old.

In the future, children will be for the poor a resource, for the plutocrat a mode of ostentation, for the bureaucrat and small rentist a sacrifice.

Current Comment

PROTECTION AGAINST DUSTS

As a direct result of the work of such men as Gardner at Saranac Lake, Sayers of the U. S. Public Health Service, Lanza of the Metropolitan Life Insurance Company and Pancoast of the University of Pennsylvania, the clinical and pathologic aspects of the silicosis problem are slowly but surely becoming clarified. In the prevention of silicosis in the mining industry, the physician has long advocated less dust in the air breathed, but the practical mining man has been unable to achieve adequate cleanliness and still continue his industrial operations. In many phases of mining and other industries, however, signal advances have been made in dust control. The Bureau of Mines has always been at the front in the formulation of such improvements. Through its Pittsburgh experiment station the Bureau of Mines now offers a new routine [1] for the testing and certifying of respirators or dust masks for protection against the inhalation, by workmen, of harmful dusts, fumes and mists. It will be recalled that it was this station which pioneered in the development of the U. S. Army gas mask at the time of America's entry into the war. Since then the bureau has formulated a series of schedules for testing and certifying industrial gas masks. So useful have the certifications become that purchasers are loath to buy masks which lack this certificate. Until the publishing of the new schedule 21 there was no federal or private testing code to which the manufacturer of respirators could turn for certification of his product. The result has been an unfortunate promiscuity in the manufacture and sale of inferior protective devices. The new schedule gives a series of examinations and tests sufficiently exacting for the most fastidious. The purchaser of industrial respirators for protecting workmen will do well to demand articles with the Bureau of Mines' stamp of approval.

3. A Spanish Medical Philosopher, Current Comment, J. A. M. A. 76: 595 (Feb. 26) 1921.

1. Procedure for Testing Filter-Type Dust, Fume, and Mist Respirators for Permissibility, Schedule 21, United States Bureau of Mines.

Association News

THE CONFERENCE ON ECONOMIC SECURITY

The Committee on Economic Security announced a national conference on the subject to be held in Washington, D. C., November 14, at the Mayflower Hotel. Round table conferences were held on unemployment insurance with Prof. Joseph H. Willets, University of Pennsylvania, presiding; on child welfare with Grace Abbott, University of Chicago, presiding, and on provision of employment. There were also conferences on old age security and on medical care. The conference on medical care was under Livingston Farrand, president of Cornell University, as presiding officer, and the discussion was led by Drs. Henry A. Luce, Detroit; Nathan B. Van Etten, New York; George E. Follansbee, Cleveland, and Mr. Michael M. Davis of the Julius Rosenwald Fund, Chicago. A reception by the President for the conferees was held at the White House at 5 o'clock and the conference was concluded with the dinner at 8 o'clock, before which Harry L. Hopkins, Federal Emergency Relief Administrator, and Frances Perkins, Secretary of Labor, were speakers.

Following the conference on November 14 the various advisory boards met on November 15 and 16. The advisory board on medicine was under the chairmanship of Dr. Harvey Cushing, the members included being Walter L. Bierring, Des Moines, Iowa; James Alexander Miller, New York; Robert B. Greenough, Boston; James D. Bruce, Ann Arbor; Rexwald Brown, Santa Barbara; Thomas Parran, Albany; George W. Crile, Cleveland; Stewart R. Roberts, Atlanta, and George M. Piersol, Philadelphia.

COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

Abstract of Minutes of Business Meeting Held at Chicago, October 27

The Council members present were Drs. Ray Lyman Wilbur (chairman), Reginald Fitz, Merritte W. Ireland, Charles E. Humiston, Frederic A. Washburn, J. H. Musser, Fred Moore and the secretary, Dr. William D. Cutter. In attendance also was Dr. Walter L. Bierring, President of the American Medical Association. Members of the Council's staff included Drs. Fritjof H. Arestad, Oswald N. Andersen, Carl M. Peterson, H. G. Weiskotten and Mr. Homer F. Sanger.

The following resolutions were adopted and other business transacted as indicated:

Resolved, That the minutes of the business meeting of June 10, 1934, be approved.

Resolved, That the minutes of the meeting of the Council's Subcommittee on Medical Education, held in New York, Sept. 15, 1934, be approved.

The proposal to send a communication to all hospitals approved for the training of interns, notifying them of the resolution adopted by the House of Delegates at the Cleveland session by which membership on the staffs of such hospitals

will be restricted to members of medical societies that are component parts of the American Medical Association was approved.

The tentative program for the forthcoming annual congress was approved.

Resolved, That the problem of the recognition of specialists in fields related to internal medicine requires further study and that the Council is not prepared to take action at this time.

Resolved, That the Council will extend its approval to such special examining boards as may furnish satisfactory evidence of the reliability of their procedure in the examination and certification of candidates and who conform to the standards adopted by the House of Delegates.

Resolved, That the lists of pathologists and radiologists as submitted be approved.

Resolved, That the Council assist and encourage state medical societies in offering postgraduate courses of instruction by (*a*) a study of the methods proposed at the Nashville meeting of the Association of American Medical Colleges, (*b*) a discussion at the meeting of state secretaries and (*c*) presentation of papers at the next annual congress.

Resolved, That the acceptance of well qualified graduates of foreign medical schools by hospitals approved for internships should not jeopardize the standing of the hospitals with the Council, provided suitable graduates of American medical schools are given first opportunity.

Resolved, That the ophthalmic service in registered hospitals be under the direction of a qualified ophthalmologist and that assistants and technicians be under his supervision.

Resolved, That the lists of hospitals for approval or otherwise be acted on in accordance with the recommendations of the staff.

WILLIAM D. CUTTER, Secretary.

MEDICAL BROADCASTS

Columbia Broadcasting System

The American Medical Association broadcasts on a western network of the Columbia Broadcasting System each Thursday afternoon on the Educational Forum from 4:30 to 4:45, central standard time. The next two broadcasts will be delivered by Dr. W. W. Bauer. The titles will be as follows:

November 22. Eat, Drink and Be Merry.
November 29. Holiday. No Broadcast.
December 6. Keep Fighting Diphtheria.

National Broadcasting Company

The American Medical Association broadcasts under the title "Your Health" on a Blue network of the National Broadcasting Company each Tuesday afternoon from 4 to 4:15, central standard time. The next three broadcasts will be as follows:

November 20. The Doctor of Tomorrow, W. W. Bauer, M.D.
November 27. Dollars and Disease, Morris Fishbein, M.D.
December 4. The Quick Lunch, W. W. Bauer, M.D.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Symposium on Heart Disease.—The heart committee of the San Francisco County Medical Society will hold its fifth graduate teaching course on heart disease, November 21-22. Sessions will be held at Mount Zion, San Francisco, University of California and Stanford University hospitals and the headquarters of the society. The final evening session will be in the nature of a clinical pathologic conference on heart disease, followed by a discussion of thyroidectomy in the treatment of congestive failure and angina pectoris.

Personal.—Dr. Miley B. Wesson, San Francisco, was awarded a silver medal by the Carnegie Hero Fund Commission, it was announced, October 27.——Dr. Albert J. Supple has been appointed health officer of South Pasadena, succeeding Dr. Edward J. Johnston, and Dr. Gilbert B. Furness, health officer for Visalia, succeeding Dr. Addison W. Preston.

Graduate Medicine.—The University of California School of Medicine is conducting graduate instruction in Sacramento, Santa Rosa, Fresno, Eureka and San Jose, in response to the demand of physicians in the state for extramural teaching. Members of the medical faculty direct these sessions on alternate Fridays and Saturdays of each month during the teaching year.

DELAWARE

Health at Wilmington.—Telegraphic reports to the U. S. Department of Commerce from eighty-six cities with a total population of 37 million, for the week ended November 3, indicate that the highest mortality rate (21.5) appears for Wilmington, and the rate for the group of cities as a whole, 10.6. The mortality rate for Wilmington for the corresponding period last year was 11.3 and for the group of cities, 11.1. The annual rate for eighty-six cities for the forty-four weeks of 1934 was 11.3 as against a rate of 10.8 for the corresponding period of the previous year. Caution should be used in the interpretation of these weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large Negro population may tend to increase the death rate.

DISTRICT OF COLUMBIA

Hospital Abandons Laboratory "Practice of Medicine."—The custom of charging private patients in its university hospital for "purely professional services" by the laboratory departments will be abandoned by George Washington University School of Medicine, in accordance with a resolution which the faculty adopted in October. This action was taken in order that such purely professional fees may be handled directly between the consultant and the patient. Professional services such as the interpretation of roentgenograms and supervision of administration of roentgen therapy are the responsibility of the consultant, the resolution further points out. On the other hand, the faculty regards the technical work of its laboratories as purely nonprofessional and approves in principle the levying of charges to any person or patient for technical services rendered and for the use of its laboratory facilities. Concluding the resolution, the faculty submits the thesis that the practice of medicine in public or private laboratories, staffed by nonprofessional people, begins only, if at all, at the point at which such technical data are interpreted and applied to the patient for the diagnosis, treatment and prognosis of disease processes.

FLORIDA

Dengue Fever.—According to newspaper reports, October 18, dengue fever was continuing in Tampa, between seventeen and twenty-four cases being reported daily. A campaign was initiated against the disease in Macon, Ga., October 17.

Personal.—Dr. and Mrs. George A. Davis, DeLand, observed their fiftieth wedding anniversary, October 22.——Dr. Harrison A. Walker, Miami Beach, was recently elected president of the Florida East Coast Medical Association, succeeding Dr. Leigh F. Robinson, Fort Lauderdale.

Society News.—At a meeting of the Dade County medical and dental societies, October 5, Dr. Frank R. Morrow and J. Harold Klock, D.D.S., Miami, discussed the relation of medicine to dentistry.——The first fall meeting of the Duval County Medical Society in Jacksonville, October 2, was devoted to a discussion of medical economics.——A symposium on carcinoma of the cervix and body of the uterus was a part of the program of the Pasco-Hernando-Citrus County Medical Society, recently. The society was entertained by Dr. George R. Creekmore, Brooksville. The speakers were Drs. William P. Adamson, Joshua C. Dickinson, Robert G. Nelson and William M. Rowlett, all of Tampa.

ILLINOIS

Southern Illinois Meeting.—At the sixtieth annual meeting of the Southern Illinois Medical Association in Mount Vernon, November 1-2, the following speakers were included on the program:

Dr. James J. Donahue, East St. Louis, Obstruction at the Pylorus.
Dr. Gershom J. Thompson, Rochester, Minn., Transurethral Prostatic Resection.
Dr. Percy H. Swahlen, St. Louis, Obstetrics.
Dr. Fred Z. Havens, Rochester, Minn., Malignancies About the Face.
Dr. Charles S. Skaggs, East St. Louis, What Is the Future of Medicine?
Dr. Frederick O. Fredrickson, Chicago, Analysis of Gastro-Intestinal Complaints with Reference to Diagnosis.
Dr. Harry Phillips, Anna, Modern Advances in Serology.
Dr. John B. Moore, Benton, Fractures.
Dr. Duncan D. Monroe, Edwardsville, The Home Treatment of Tuberculosis.
Dr. James S. Johnson, Cairo, Eye Injuries.

Society News.—The Christian County Medical Society was addressed in Taylorville, October 24, by Dr. Max S. Wien, Chicago, on "Relation of Dermatology to General Medicine."——At a meeting of the Will-Grundy County Medical Society, October 24, Dr. Edwin W. Hirsch, Chicago, discussed "Pathology, Diagnosis and Treatment of Prostatic Hypertrophy."——Speakers before the Pike County Medical Society in Barry,

October 25, were Drs. Edwin P. Sloan on thyroid deficiencies and Andrew J. Casner, types of pneumonia and their significance; both physicians are from Bloomington.——Members of the faculty of the University of Iowa College of Medicine, Iowa City, presented the program before the La Salle County Medical Society in Ottawa, October 18; Drs. Dean M. Lierle discussed the common cold and Nathaniel G. Alcock, diathermy in treatment of enlarged prostate.——Speakers before the Tri-County Medical Society (Warren, Knox, Henry) in Monmouth, October 18, were Drs. Julius H. Hess on "Present Status of Serum Therapy in Pediatrics"; William R. Cubbins, "Fractures Around the Knee Joint," and Frederick H. Falls, "Management of Eclamptogenic Toxemia." All are from Chicago. ——The Kane County Medical Society adopted a resolution, October 11, declaring itself "opposed to the schemes grouped under the label of sickness insurance." Dr. Herman L. Kretschmer, Chicago, addressed the meeting on "Prostatic Obstructions."

Chicago

Personal.—A dinner was held in honor of Dr. Henry S. Houghton, director of clinics and associate dean of the Division of Biological Sciences, University of Chicago, November 5. Dr. Houghton recently resigned to become advisory representative of the China Medical Board of the Rockefeller Foundation. Speakers at the dinner included Frederic C. Woodward, LL.D., vice president of the university; Frank R. Lillie, dean, and Dr. Dallas B. Phemister, professor of surgery in the division.

Society News.—Speakers before the Chicago Gynecological Society, November 16, included Drs. Gustav Kolischer and Arthur H. Curtis on pathologic features of the female urethra and bladder, respectively.——Dr. Bernard H. Nichols, Cleveland, addressed the Chicago Roentgen Society, November 8, on "Value of Roentgenologic Examination in Right Abdominal Pain," and Dr. William E. Anspach, "Atelectasis, Bronchiectasis and the Triangular Shadow in Children."——At a meeting of the Chicago Pathological Society, November 12, speakers included Dr. H. Gideon Wells and Maud Slye on "Tumors of Islet Tissue with Hyperinsulinism in a Dog."——Dr. Carl E. Badgley, professor of surgery, University of Michigan Medical School, addressed the Chicago Orthopedic Club, November 16, on "The Value of the Thrust Graft in Atrophic and Sclerotic Nonunion." Dr. Maurice A. Bernstein also spoke on "Cysts of the Semilunar Cartilage." A dinner in honor of Dr. Badgley preceded the meeting.——Dr. Clifford G. Grulee will give a public lecture, November 22, one of a series sponsored by the Chicago Heart Association; his subject will be "The Spoiled Child in Heart Disease." Dr. Newell C. Gilbert opened the series, November 8, with a discussion of the principal causes of heart disease.

INDIANA

Hospital News.—The Smith-Esteb Memorial Tuberculosis Hospital was dedicated at Richmond, October 7. Speakers included Murray Auerbach, executive secretary of the state tuberculosis association. A gift of $100,000 by Mrs. David Esteb was largely responsible for the hospital, it was stated.

Personal.—Dr. and Mrs. Charles Titus, Wilkinson, entertained the Hancock County Medical Society at dinner, October 4; the occasion was the couple's twentieth wedding anniversary. Speakers were Drs. Rollin H. Moser and Louis H. Segar, Indianapolis, on "Diagnostic Interpretation of Gastro-Intestinal Symptoms" and "Recent Advancement in Pediatrics," respectively.

IOWA

Personal.—Dr. Fred L. Wells, Des Moines, medical director of the Equitable Life Insurance Company of Iowa, was elected president of the Association of Life Insurance Medical Directors at its annual convention in New York, October 20. ——Dr. Edward H. Files was elected secretary of the Cedar Rapids Symphony Orchestra recently.

Tilton Restrained from "Practicing."—A permanent injunction restraining Lester J. Tilton, Clinton, from practicing medicine has been obtained by the state, according to the Des Moines *Tribune*. It was stated that while he did not have a license to practice medicine he had worked up a large cancer cure business. Early this year Tilton was sentenced to jail for thirty days for nonpayment of a $1,000 fine imposed in federal court for violation of the federal food and drugs act.

Public Health Meeting.—The Iowa Public Health Association held its ninth annual meeting in Des Moines, October 26. Speakers included Drs. Garner M. Byington, medical director, W. K. Kellogg Foundation, Battle Creek, Mich.; Orianna McDaniel, Minneapolis, of the Minnesota State Department of Health, and Earle G. Brown, Topeka, executive secretary, Kansas State Board of Health. Their subjects were, respectively, "The Michigan Community Health Project as Sponsored by the W. K. Kellogg Foundation," "Observations on an Outbreak of Virulent Smallpox in the Middle West," and "Kansas Accident Facts." The evening meeting was a joint session with the Des Moines Academy of Medicine and the Polk County Medical Society, at which the guest speaker was Dr. Russell L. Cecil, New York, on "Influenza and the Common Cold."

MARYLAND

Personal.—Francis M. Root, Ph.D., associate professor of medical entomology, Johns Hopkins School of Hygiene and Public Health, died at the Johns Hopkins Hospital, Baltimore, October 21, at the age of 45. Dr. Root was well known for his work in identifying insects carrying malaria and yellow fever and had led many expeditions into the interior of South America and other tropical sections to study mosquitoes and to devise methods of combating these diseases at the source. He was managing editor of the *American Journal of Hygiene*. A graduate of Oberlin College, Dr. Root had received the degree of doctor of philosophy from Johns Hopkins University.

MINNESOTA

Sentenced for Practicing Without License.—James A. Enright, Minneapolis, pleaded guilty, August 30, to practicing healing without a basic science certificate and was sentenced to thirty days in the Minneapolis Workhouse and placed on probation for one year. Enright's claims that he was a doctor and a graduate of the University of California were found to be untrue. According to the state board of medical examiners, he has no medical education, but during a strike in Minneapolis he received money for treating and caring for injured truck drivers.

Dr. Webb Gives First Bell Lecture.—Dr. Gerald B. Webb, Colorado Springs, formerly president, National Tuberculosis Association, will deliver the first John W. Bell Lecture, December 3. This lectureship was recently established by the Hennepin County Tuberculosis Association in the Hennepin County Medical Society (THE JOURNAL, August 18, p. 496). Dr. Bell, who died in 1933, was a member of the House of Delegates of the American Medical Association. He also served as president of the state medical association, the Hennepin County Medical Society and the Minnesota Academy of Medicine, and was a member of the state senate from 1891 to 1895. He was emeritus professor of medicine and at one time professor of physical diagnosis and clinical medicine at the University of Minnesota Medical School. Dr. Webb is president of the Colorado State Board of Medical Examiners and past president of the state medical society.

MISSOURI

Tuberculosis Surveys.—The state tuberculosis association and the state department of health are cooperating in surveys throughout the state. Work in Morgan County, which included a tuberculosis and tuberculin testing study, has just been completed by the local tuberculosis association, and a similar survey is in progress in Johnson County. The Nodaway County medical and tuberculosis associations recently finished a survey of open cases. Plans are now being made to give the tuberculin test in contact cases.

Medical Section in Science Academy.—A medical section will be created at the meeting of the Missouri Academy of Science in Columbia, December 6. Dr. Dudley S. Conley, dean, University of Missouri School of Medicine, Columbia, is chairman of the new section. Charter members will be exempt from the entrance fee of $1. Initial dues are $1.50. Other sections to be formed at this meeting will be mathematics, physics, chemistry, astronomy, geology and geography, zoology, botany, anthropology, psychology, sociology, economics, history, philology, engineering, philosophy and political science.

Society News.—The St. Louis Neuropsychiatric Society will be addressed, November 26, by Dr. Louis L. Tureen on "Varicosities of the Vein of Galen."——Speakers before the St. Louis Medical Society, October 23, were Drs. Grayson L. Carroll on "Progress of Urology," and Waltman Walters, Rochester, Minn., on "Ureterosigmoidal Transplantations and Other Plastic Procedures for Congenital Abnormalities of the Genito-Urinary Tract." The program was given by the Southwestern Branch of the American Urological Association.—— Dr. James H. Forsee, Denver, addressed the Boone County

Medical Society, October 2, on "Surgical Treatment of Pulmonary Tuberculosis."——Dr. J. Isfred Hofbauer, Cincinnati, addressed the Kansas City Obstetrical and Gynecological Society, September 27, on "Recent Views on the Etiology and Etiologic Treatment of the Late Toxemias of Pregnancy."——Dr. Dayton I. L. Seabaugh, Jackson, discussed the diagnosis and treatment of pneumonia before the Cape Girardeau County Medical Society, October 8.

NEBRASKA

Society News.—Dr. Ernest L. MacQuiddy, Omaha, addressed the Hall-Merrick-Howard Counties Medical Society, Grand Island, October 25, on "Allergic Problems in Everyday Practice."——At a meeting of the Third Councilor District Medical Society in Beatrice, October 16, speakers included Drs. William W. Waddell, Beatrice, on "Treatment of Pneumococcic Pneumonia"; John C. Thompson, Lincoln, "The Irritable Bowel and Its Treatment"; Melvin W. Binger, Rochester, Minn., "Hypertension," and Karl S. J. Hohlen, Lincoln, state medical relief administrator, "The Set-Up of the N E R A with the Physician."——The Southwest Nebraska Medical Society held a meeting in McCook, November 12, with the following speakers: Drs. James E. M. Thomson, Lincoln, on "Fixed Traction with Kirschner Wire, Used in Treatment of Certain Fractures"; Carl R. Carlson, Wauneta, "Pertussis," and Carroll W. Dewey, Danbury, "Cyclic Vomiting in Children."

NEW YORK

Personal.—Dr. Herbert U. Williams, professor of pathology and bacteriology at the University of Buffalo School of Medicine, has retired after forty years of teaching. Dr. Kornel Ludwig Terplan, research professor of pathology since 1930, succeeded Dr. Williams.

Society News.—Drs. William F. Rienhoff Jr., Baltimore, and Edgar Mayer, Saranac Lake, addressed the Medical Society of the County of Nassau, October 30, on "Total Unilateral Pneumonectomy" and "Treatment of Lobar Pneumonia by Artificial Pneumothorax," respectively.——A symposium on the eye was presented before the Buffalo Academy of Medicine, October 31, by Drs. Harry M. Weed, Ivan J. Koenig and Herbert H. Glosser.——Dr. George W. Crile, Cleveland, addressed the Medical Society of the County of Monroe, Rochester, November 1, on "Newer Methods of Treatment of Peptic Ulcer, Spastic Constipation and Indigestion."——Henry F. Vaughan, Dr.P.H., of Detroit, will address the Medical Society of Westchester County, White Plains, November 20, on "The Family Physician and Preventive Medicine."

New York City

The Brickner Lecture.—Dr. Moses Swick gave the fourth Walter M. Brickner Lecture at the Hospital for Joint Diseases, November 8. His subject was "Radiopaque Media in Urology."

Hospital News.—The program of the regular clinical society meeting at New York Polyclinic Medical School and Hospital included addresses by Drs. Damaso de Rivas, Philadelphia, on "Amebic Dysentery"; Francis G. Blake, New Haven, Conn., "Artificial Pneumothorax in the Treatment of Lobar Pneumonia," and Dr. Charles W. Stiles, Washington, D. C., "Medicozoological Aspects of the Race Problem."

Hospital Appointments Available.—The Hospital for Joint Diseases announces that an examination will be held December 26 at the hospital to fill six places on the general service, three to begin July 1, 1935, and three, Jan. 1, 1936, for two years' rotating service. The hospital provides maintenance and uniforms. Graduating students and graduates (unmarried men) of class A medical schools are eligible. Applications should be addressed to the director of the hospital, Madison Avenue and One Hundred and Twenty-Third Street.

NORTH CAROLINA

District Meetings.—At the annual meeting of the Seventh District Medical Society in Lincolnton, October 30, speakers included Drs. Paul R. MacFadyen, Concord, on "Idiopathic Epilepsy"; William G. Bandy, Lincolnton, "Coronary Thrombosis"; James M. Northington, Charlotte, "The Need for Vigorous Medical Leadership"; William M. Roberts, Gastonia, "Reconstruction of the Infantile Paralytic Cripple," and Addison G. Brenizer, Charlotte, "Ureteral Transplantations—Simplification of Methods." Dr. Paul P. McCain, Sanatorium, president of the Medical Society of the State of North Carolina, made an address at the banquet in the evening. Dr. Lester A. Crowell Jr., Lincolnton, was elected president.——Drs. John Shelton Horsley, Richmond, Va., and Stewart R. Roberts, Atlanta, were guest speakers at the fall meeting of the Tenth District Medical Society, in Asheville, October 24. Dr. Horsley discussed "Symptoms, Diagnosis and Treatment of Cancer of the Colon and Rectum"; Dr. Roberts, "The Tachycardias and the Great Tachycardia." Dr. J. Rufus McCracken, Waynesville, was elected president.——Dr. Isaac H. Manning, Chapel Hill, was the guest speaker at the semiannual meeting of the Eighth District Medical Society at Elkin, October 16, on group hospitalization. Speakers on the scientific program included Drs. Kenneth B. Geddie, High Point, on "Prophylactic Immunization"; James H. McNeill, North Wilkesboro, "Artificial Fever Therapy," and Fred K. Garvey, Winston-Salem, "Tuberculosis of the Genito-Urinary Tract."

OHIO

Fifty Years of Service.—Dr. George D. Lummis, health commissioner of Middletown for forty-four years, was guest of honor at a banquet given by physicians of Middletown, October 24, celebrating his completion of fifty years as a physician. Dr. Bryan Sharkey was toastmaster and speakers included Mr. George M. Verity and Mr. B. F. Harwitz, Middletown; Dr. Ben R. McClellan, Xenia; Dr. Arthur O. Peters, Dayton; Dr. Mark Millikin, Hamilton; Dr. Elroy T. Storer, Middletown, and Dr. Lummis. Dr. Edward O. Bauer presented a watch to Dr. Lummis as a token of appreciation from his fellow physicians.

Memorial to Dr. Probst.—A memorial plaque honoring the late Dr. Charles O. Probst was dedicated at the Ohio State Sanatorium, Mount Vernon, October 27, the twenty-fifth anniversary of the founding of the hospital. Dr. Leslie L. Bigelow, Columbus, made the presentation speech and the plaque was accepted by John McSweeney, state director of public welfare. A scientific program of addresses on tuberculosis was presented by Drs. Henry Kennon Dunham, John H. Skavlem, Cecil W. Hickam and James N. Christensen, Cincinnati. Dr. Probst, who died in 1933, was for twenty-five years secretary of the state board of health, for ten years professor of hygiene, Starling Medical College, Columbus, and served as president of the Ohio Society for the Prevention of Tuberculosis and of the American Public Health Association.

OKLAHOMA

Clinical Conference in Oklahoma City.—The fifth annual conference of the Oklahoma City Clinical Society was held October 29-November 1 with headquarters at the Hotel Biltmore. About 600 physicians attended. Among guest speakers were:

Dr. Russell L. Cecil, New York, Modern Treatment of Lobar Pneumonia; Diagnosis and Treatment of Chronic Arthritis.
Dr. George Piness, Los Angeles, Allergy as Diagnostic Problem in Respiratory Disease.
Dr. Temple S. Fay, Philadelphia, Treatment of Head Injuries.
Dr. Howard L. Beye, Iowa City, Intestinal Obstruction.
Dr. Walter L. Bierring, Des Moines, Iowa, President, American Medical Association, Acute Diseases of Blood-Forming Organs.
Dr. Otto H. Schwarz, St. Louis, Late Toxemia of Pregnancy.
Dr. Mynie G. Peterman, Milwaukee, Acute Infections in Infancy.

A public health meeting was held October 31, at which Dr. Bierring discussed history of medicine; Dr. Fay, headaches; Dr. Beye, pain in the abdomen; Dr. Peterman, children's crying; Dr. Albert Soiland, Los Angeles, cancer, and Dr. John J. Shea, Memphis, Tenn., care of children's eyes.

OREGON

Annual Registration Due December 1.—All practitioners of medicine and surgery holding licenses to practice in Oregon are required by law to be registered annually on or before December 1, with the secretary of the board of medical examiners, and at that time to pay a fee of $5. A practitioner failing to register is subject to a penalty of $1 for each thirty days of default, and his failure to reregister within ninety days after December 1 is a misdemeanor.

PENNSYLVANIA

Personal.—Dr. Enoch H. Adams, Berwick, has been appointed surgeon in chief to the Center County Hospital, Bellefonte.——Dr. James Norman White, Scranton, has been named surgeon in chief to the Moses Taylor Hospital, Scranton.——Dr. Oscar Paul Holmer, assistant director of the state bureau of mental health, Harrisburg, has been named psychiatrist to the Berks County Mental Health Clinic, on a part time basis. He succeeds Dr. Ronald B. McIntosh, who resigned to become clinical director of Norristown State Hospital.——Dr. William Frederick Herbst has been chosen chief of the

medical department of Allentown Hospital to succeed the late Dr. Joseph M. Weaver.——Dr. Walter W. Hammond Jr., of the U. S. Public Health Service has been assigned as surgeon to the U. S. Northeastern Penitentiary at Lewisburg, replacing Dr. Russell Thomas, who has been transferred to Baltimore.

Philadelphia

Newbold Lecture.—Dr. Walter Bradford Cannon, Boston, delivered the thirty-third annual Mary Scott Newbold Lecture of the College of Physicians of Philadelphia, November 7, on "Stresses and Strains of Homeostasis."

Personal.—Dr. William Taylor, chief of staff of the Orthopedic Hospital, was the guest of honor at a reception given by the staff executives and the board of managers of the hospital, October 16, in appreciation of his fifty years of service to the hospital.

Portrait of Dr. Flick.—Friends of Dr. Lawrence F. Flick recently presented a portrait of him to Jefferson Medical College, from which he was graduated in 1879. Dr. Flick is still engaged in active practice. He is a former director of the Henry Phipps Institute and is the author of two books as well as of many articles on tuberculosis.

Hospital News.—Dr. Frank E. Leivy delivered the second of a series of nine health lectures for the public at Mount Sinai Hospital, October 24, on "Diet and Health"; Dr. Maxwell Scarf will deliver the next lecture, November 28, on arthritis and rheumatism, and Dr. Eugene Rush will speak, December 26, on "How to Keep Your Children Healthy."

Society News.—Dr. Austin T. Smith addressed the Philadelphia Laryngological Society, November 6, on "Bone Lesions of the Nose and Sinuses, with Special Reference to Hypertrophic Changes and Tumor Formation."——Dr. Herbert Lund, among other speakers, presented before the Pathological Society of Philadelphia, November 8, a paper on "The Incidence of Malignant Tumors at Philadelphia General Hospital, 1867-1934, with Special Reference to Primary Cancer of the Lung."——Speakers at a meeting of the Philadelphia Psychiatric Society, November 9, were F. Gilman Spencer, Esq., on "The Psychiatrist and the Law" and Raymond M. Remick, Esq., on "Wills and Testamentary Capacity."——Sir Harold Gillies, London, addressed the Philadelphia Academy of Surgery, November 5, on "Plastic Operations and Their Psychologic Effect," and Drs. John Stewart Rodman and William G. Leaman Jr., on "Surgical Risks, with Special Reference to the Cardiovascular System."

Pittsburgh

Society News.—Speakers before the Pittsburgh Academy of Medicine, October 23, were Drs. John D. Singley, on "Value of the Omentum in Abdominal Surgery, Particularly with Reference to Free Omental Grafts"; Henry C. Flood, "Congenital Defects," and Frederick B. Utley, "Treatment of Peptic Ulcer and Carcinoma of the Stomach."——The Allegheny County Medical Society has prepared a series of newspaper articles on diet and reducing, which are appearing in the Pittsburgh *Sun-Telegraph.*

WISCONSIN

Scarlet Fever in Milwaukee.—Scarlet fever cases in Milwaukee reached a high point of 961, October 29, newspapers reported. Dr. John P. Koehler, city health officer, asked the state board of health to reduce the quarantine period from four to three weeks in order to relieve crowded conditions at the South View Isolation Hospital, and the city common council appropriated $10,000 as an emergency fund to help fight the epidemic. A campaign to locate carriers among school children was begun, October 16.

Society News.—Diagnosis and treatment of goiter were the subject of addresses at the annual meeting of the First Councilor District of the Medical Society of Wisconsin, Beaver Dam, October 10, by Drs. Marshall O. Boudry and David J. Twohig, Fond du Lac, and Arnold S. Jackson, Madison.——Drs. Alfred Blalock, Nashville, Tenn., and John P. Koehler, health commissioner of Milwaukee, were speakers before the Medical Society of Milwaukee County, October 12; their subjects were "Circulatory Changes in Shock" and "What Is Wrong with the Health Department?" respectively.——Dr. Emile F. Holman, San Francisco, addressed the Milwaukee Society of Clinical Surgery, October 13, on "Clinical and Experimental Observations on Pulmonary Suppuration."——Drs. Charles R. Marquardt and Herman A. Heise addressed the Milwaukee Academy of Medicine, September 18, on "Injection Treatment of Hydrocele" and "Alcohol in Relation to Automobile Accidents," respectively.———Dr. Ejvind P. K. Fenger, Oak Terrace, Minn., addressed the Fond du Lac County Medical Society, Fond du Lac, October 16, on early diagnosis of tuberculosis.

GENERAL

Licenses Stolen.—Dr. David Hershkowitz, New York, reports that his diploma and two licenses issued by Maryland and Louisiana were stolen from his office during the week-end of October 20. A license and certificate of registration with the Los Angeles Health Department, together with a receipt for 1934 annual registration have been reported lost by Dr. Edgar Frank Mauer, Los Angeles.

Board of Psychiatry and Neurology Organized.—The American Board of Psychiatry and Neurology was organized at a meeting in New York, October 20, with the following officers: Drs. H. Douglas Singer, Chicago, president; Charles Macfie Campbell, Boston, vice president, and Walter Freeman, Washington, D. C., secretary. Other members are Drs. Lewis J. Pollock, Chicago; George W. Hall, Chicago; Franklin G. Ebaugh, Denver; Lloyd H. Ziegler, Albany, N. Y.; James Allen Jackson, Danville, Pa., and Adolf Meyer, Baltimore. A committee was appointed to consider plans for examinations, credentials and forms for application blanks. It is proposed to send application blanks to candidates soon after January 1935, and the first examination will probably be held in New York in June 1935. Further information may be obtained from the secretary, Dr. Freeman, 1726 Eye Street, Washington, D. C.

Society News.—The American Nurses' Association announces that recommendations for the Walter Burns Saunders Memorial Medal for distinguished service in nursing may come from persons other than nurses. Recommendations must be on file with the association, whose address is 50 West Fiftieth Street, New York, by December 31.——Dr. Ross V. Patterson, Philadelphia, was reelected president of the Association of American Medical Colleges at the annual meeting in Nashville, Tenn., October 29-31. Under a new plan, Dr. John H. Wyckoff, New York, was chosen president-elect. Other officers are: Drs. Thurman D. Kitchin, Wake Forest, N. C., vice president; Fred C. Zapffe, Chicago, secretary, and Basil C. H. Harvey, Chicago, treasurer; the next annual meeting will be held in Toronto, Oct. 28-30, 1935.——Dr. Leonce J. Kosminsky, Texarkana, was elected president of the Tri-State Medical Society (Arkansas, Louisiana, Texas), at its annual meeting, October 17, and Dr. George W. Parson, Texarkana, was named secretary. The next annual meeting will be held in Texarkana.

National Committee on Contraceptive Legislation.—The organization of a National Medical Committee on Federal and State Contraceptive Legislation has been announced. Its objective is the repeal of state and national laws restricting the freedom of the physician to prescribe contraceptive methods and devices, when it is his judgment that he deems it the proper treatment. Created by a local group of physicians in Washington, D. C., it bears no relationship to any medical society. It proposes to remain entirely independent of and unassociated with any lay groups advocating so-called birth control legislation and will not accept any financial aid from these sources. The committee has not yet selected a chairman, but other officers chosen are: vice chairman, Dr. Palmer Findley, Omaha; secretary-treasurer, Dr. Prentiss Willson, Washington, D. C. Dr. Everett D. Plass, Iowa City, was named chairman of the executive committee, Dr. Frederick C. Holden, New York, vice chairman, and Dr. Willson, secretary. Other members of the executive committee include the following physicians: Robert L. DeNormandie, Boston; James R. McCord, Atlanta; Fred J. Taussig, St. Louis; Owen Jones Toland, Philadelphia; George Gray Ward, New York; Frank W. Lynch, San Francisco; Henry C. Macatee, Washington; Adolf Meyer, Baltimore; Charles Jefferson Miller, New Orleans; Joseph C. Placak, Cleveland; William Allen Pusey, Chicago, and Frederick C. Warnshuis, San Francisco.

CORRECTION

Chiniofon Therapy in Amebiasis.—In his article in THE JOURNAL, October 20, page 1226, Dr. Alfred C. Reed stated that "Craig believes that chiniofon therapy requires bed rest, administration both by mouth and by rectum, and a careful diet." Dr. Reed desires to make clear that this statement refers to Dr. Craig's views as expressed in his article in THE JOURNAL, April 28, 1928. Dr. Craig's later views, expressed in an article in the *Southern Medical Journal* in December 1932, were that chiniofon is very effective without adjuvant treatment for carriers or those presenting slight symptoms of amebiasis.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 20, 1934.

The Protection of X-Ray and Radium Workers

With the object of preventing casualties to x-ray and radium workers, the British X-Ray and Radium Protection Committee was formed in 1921 as the result of cooperative action of the Royal Society of Medicine, the Roentgen Society, the British Association for the Advancement of Radiology and Physiotherapy (now the British Institute of Radiology incorporated with the Roentgen Society) the Institute of Physics, the Radium Institute and the National Physical Laboratory. The chairman of the committee is Sir Humphry Rolleston, and its members are leading radiologists and physicists. Its first recommendation was issued in 1921, and revised ones followed in 1923 and 1927. At the instance of the British committee, international recommendations for x-ray and radium protection were adopted at Stockholm in 1928 by the second International Congress of Radiology. These were largely based on the British proposals. The problem of the adequate protection of the x-ray worker has been substantially eased by the introduction of the self-protected tube and more recently by the "shockproof" tube and equipment. The committee has now issued a fourth report, which follows in the main the form of the International Recommendations and contains a number of alterations and additions based on the experience of the committee and the National Physical Laboratory, in its inspection and testing work carried out in association with the committee.

The present report lays down that the dangers of overexposure to x-rays and radium can be avoided by provision of adequate protection and suitable working conditions. The effects to be guarded against are (1) injuries to the superficial tissues and (2) derangements of internal organs and blood changes. The evidence available at present suggests that under satisfactory working conditions a healthy person can tolerate exposure to x-rays to an extent of about 0.2 roentgen daily. On the basis of continuous irradiation during a working day of seven hours, this figure corresponds to a dosage of 10^{-5} roentgen per second. No similar tolerance dose is at present available for the gamma rays of radium.

WORKING HOURS AND OTHER CONDITIONS

The following are recommended for whole time x-ray and radium workers: 1. Not more than seven working hours a day. No other hospital service. 2. Not more than five working days a week, the off days to be spent outdoors as much as possible. 3. Not less than four holidays a year, preferably consecutive. 4. No one to be employed whose blood or general health is unsatisfactory. Before work or training is begun, the normal leukocyte level should be found by making three afternoon counts. If none of the total counts reach 6,000 and none of the lymphocytes 1,200 the applicant should not be accepted for service. Periodic total and differential counts should be made every six months in the case of the x-ray worker and every three months in the case of the radium worker; but the six months period may be considerably extended for x-ray workers in departments that otherwise comply with the recommendations. A decided and sustained drop in total or lymphocyte counts indicates cessation of work and treatment for an adequate period. On resumption of work the circumstances should be reviewed to prevent recurrence.

GENERAL X-RAY AND RADIUM RECOMMENDATIONS

1. X-ray and radium departments should not be below the ground floor, and damp rooms should be avoided. 2. All rooms should be provided with good natural lighting and facilities for admitting fresh air and sunshine. 3. They should be provided with adequate exhaust ventilation. 4. They should preferably be decorated in light colors. 5. A working temperature of from 18 to 21 C. (64.4 to 69.8 F.) is desirable. 6. The rooms should be large enough for convenient lay out of equipment. A minimum of 25 square meters is recommended for x-ray rooms and 10 square meters for dark rooms. Ceilings should not be less than 3.5 meters high. 7. X-ray generating apparatus employing mechanical rectifiers should preferably be in a separate room from the tube.

X-RAY PROTECTIVE RECOMMENDATIONS

1. The operator should on no account expose himself to a direct beam of the rays. 2. He should place himself as far as practicable from the tube. 3. The tube should be self protected with material of adequate lead equivalent. 4. For diagnostic work with other than completely protected tubes, the operator should be protected from stray radiation by a screen of minimum lead equivalent of 1 mm. 5. Screening examinations should be conducted as rapidly as possible with minimum intensities and apertures. The material of the diaphragm should be equivalent to not less than 2 mm. of lead. To prevent lateral escape of direct radiation, the diaphragm should be fitted within a protective enclosure. Palpation with the hand should be reduced to a minimum. 6. If small, the fluorescent screen should be provided with a protective "surround" for protection in all positions. 7. Screening couches and stands should provide arrangements for protecting the operator against scattered radiations from the patient. 8. Protective gloves should be lined with material of a minimum value of ⅓ mm. of lead and protective aprons of 0.5 mm. 9. A calibrated ionization dose meter for use during treatment is strongly recommended. 10. During treatment the operator should be outside the x-ray room, behind a protective wall of lead equivalent to not less than 2 mm. for a single tube excited by voltages up to 200 kilovolts and proportionately increased for higher voltages. 11. Inspection windows in screens and walls should be of protective value equal to that of the surrounding screen or wall. 12. There should be protection against omission of a metal filter in treatment.

RADIUM PROTECTION

Protection is required against the effect of beta rays on the hands and gamma rays on internal organs. 1. For protection of the hands, reliance should be placed in the first place on distance. The radium should be manipulated with long-handled forceps and carried from place to place in long-handled boxes lined with at least 1 cm. of lead. All manipulations should be as rapid as possible. 2. When not in use, radium should be stored in a safe as distant as possible from the personnel. The safe should be provided with separate drawers individually protected. The thickness of lead varies from 8.5 cm. for 0.2 Gm. of radium element to 17 cm. for 10 Gm. 3. A separate room with exhaust fan should be provided for the make up of screened tubes and applicators, and occupied only during such work. 4. For protection against gamma rays during handling, a screen of not less than 2.5 cm. of lead should be used, and proximity to the radium should occur only during the actual work and for as short a time as possible. 5. For measurement there should be a separate room. 6. Nurses should not remain in proximity to patients being treated with quantities of radium exceeding 0.5 Gm.

RADON

Protection against the beta and gamma rays has likewise to be provided. 1. The handling of radon should be, as far as possible, during its relatively inactive state. 2. The escape of radon should be guarded against and the room in which it is

prepared provided with an exhaust fan controlled from the outside. 3. When radon is likely to come in direct contact with the fingers, thin rubber gloves should be worn. Otherwise the protective measures for radium salts should be carried out. 4. The pumping room should preferably be in a separate building. The radium in solution should be heavily screened.

A Change in the Law Dangerous to the Medical Profession

A recent change in the law, which allows survival of an action for damages after death has caused some concern in the medical profession. Formerly the law was actio personalis moritur cum persona. If a man died as the result of injury due to negligence, his relatives could not continue any suit pending at the time of death or begin a suit. But in the middle of the last century an act was passed allowing those dependent on the deceased, such as his children, to bring an action if death was due to negligence. This right was not only limited to dependents but was restricted in other ways. The action must be brought within a year of death and the amount of compensation must have reference to the degree of dependence. The law has been altered. An action can now be brought for personal injury caused by negligence, notwithstanding the death of the victim, and whether the death was caused by the negligence complained of or not. Further, the action may be brought at any time within six years of the injury. The *British Medical Journal* considers that the change in the law is fraught with grave danger to the medical profession and instances the case in which a patient dies on the operating table. He may have submitted to the operation knowing that it was his only hope and be the last person in the world to charge the surgeon with negligence. Yet the surgeon is exposed for six years to the risk of an action at the suit of those who are interested in the estate of the deceased. They need not have been in any way related to him or dependent on him. Again, a patient who has submitted to treatment or to an operation may subsequently die from some supervening injury or disease. His physician remains for six years exposed to the risk of an action, although the patient had no intention of bringing one and had no ground of complaint. The new law does show consideration for those liable to be affected by it by restricting the amount of damages. However, these must not be exemplary and damages to the estate which are merely the result of the death must not be awarded. For example, if an annuitant were to die, the resulting loss to his estate must not be considered. But the great grievance of the medical and other professions remains—that actions pending at the time of the death may be continued not merely for the benefit of dependents but for the benefit of any one interested in the estate.

Clinical Research at Guy's Hospital

Guy's Hospital has accepted the invitation of the Medical Research Council to cooperate in the establishment of a new unit for scientific research in clinical medicine. The council will provide the salary of a whole time director and his assistants, with the cost of all apparatus and research material. The hospital will provide the laboratory accommodations and maintain beds at the disposal of the director of the unit, who will ex officio be a member of the visiting staff with a seat on the medical committee and on the committee of the medical school. Dr. Ronald T. Grant, heretofore working in the service of the council in the department of clinical research at University College Hospital, has been appointed director of the new unit. The invitation was issued to Guy's Hospital by the Medical Research Council in accordance with its general policy of improving the facilities available in this country for the scientific study of disease in man, by means of increasing the number of higher appointments for whole time workers. The money required for the purpose was released when the senior post formerly maintained by them at University College Hospital, held by Sir Thomas Lewis, received permanent endowment from the Rockefeller Foundation.

The London Medical Schools

At a dinner of the Knights of the Round Table Club, held in honor of London University, Sir Ernest Graham-Little (dermatologist and member of parliament for the university) referred to the new buildings at Bloomsbury of the university as the most ambitious program since the time of Wren. There were twelve famous medical schools in London, constituting the faculty of medicine of the university. The fame of these schools was enhanced by the fact that the ancient universities of Oxford and Cambridge sent their medical students to them for their clinical education. The facilities for medical education in London were unequaled anywhere else in the world. Two relatively new additions indicated the uninterrupted progress of the university. The London School of Hygiene and Tropical Medicine, founded ten years ago as the result of a gift of nearly $2,500,000 from the Rockefeller Trust, had already established itself as the premier school of tropical medicine in the world. The newly created postgraduate school at Hammersmith, which was the joint responsibility of the government, the university and the London County Council, filled the most conspicuous gap that existed in the opportunities which London offered.

Centenarians

The deaths of thirteen reputed centenarians were registered in Scotland in 1933, all being women. The registered age was verified in five cases and disproved in three, while in the remaining five no evidence was available either to support or to disprove the claim. Of those verified, two were aged 100, two 101 and one 103. The practice of endeavoring to verify the ages of reputed centenarians was begun in 1910. Since that date 331 such deaths have been registered, 51 of men and 180 of women. Of the 331, 171 were verified and 54 disproved, while for 106 no evidence was available.

PARIS

(From Our Regular Correspondent)

Oct. 29, 1934.

The French Surgical Congress

The forty-third annual meeting of French surgeons has just been held in Paris. Every year, three subjects are chosen by the members of the congress to be discussed during the following year's session. Two members are designated to make a thorough survey of the literature of the subject assigned to them and to include any work that they may have contributed. The subjects chosen for this year were "Pathogenesis and Treatment of Proliferating and Stricture-Forming Proctitis," "Treatment of Suppurative Arthritis of the Knee (War Injuries Excepted)" and "Surgery of the Suprarenals." These papers are sent in book form to the members about a month before the congress, thus enabling them to be better prepared to take part in the discussions.

PATHOGENESIS AND TREATMENT OF PROLIFERATING AND STRICTURE-FORMING PROCTITIS

Gatellier of Paris and Weiss of Strasbourg reached the following conclusions on the first of these subjects: A proliferating and stricture-forming proctitis is only one of the clinical manifestations of a much more generalized condition, characterized essentially by a lymphangitis, which may have its origin simultaneously or individually (in only one location) in the lymph vessels of the perineal, anorectal or inguinal regions, genitalia or iliac fossa. In the majority of cases, such a proctitis is due to the virus of the Nicolas-Favre disease. It is

proposed by the authors to abandon the term "benign lymphogranuloma" and to adopt the terms "disease of Nicolas-Favre, inguinal poradenitis or poradéno-lymphite inguino-ilio-périnéale" following the work of Frei and others during the last ten years on this so-called fourth venereal disease. One can exclude syphilis, gonorrhea and the mycoses as etiologic factors. Tuberculosis can be considered only as a rare cause. The review of 139 reports of operations for inflammatory strictures of the rectum demonstrates that surgical treatment is of no avail because recurrence is the rule, even when resection is performed at a level where the tissue appears normal. This failure is due to a periproctitis, which is constantly advancing by way of the lymph vessels. This periproctitis results in the formation of a diffuse fibrous induration progressively involving the perirectal, perineal, ischiorectal and subperitoneal tissues. The subjacent progressive lymphangitis is found even in apparently normal tissue.

Nonoperative measures and a colostomy, only when obstruction occurs, are recommended, instead of resection, until the time when some specific treatment for the virus of the Nicolas-Favre disease has been found.

TREATMENT OF SUPPURATIVE ARTHRITIS OF THE KNEE

Of the second subject chosen for discussion, Huet of Paris and de Fourmestraux of Chartres gave an equally thorough review. Every wound in the vicinity of the knee in civil practice should be explored and disinfected as a prophylactic measure. The cases in which acute suppuration is evident can be divided in adults into moderate and severe. In the former, one can try simple exploratory puncture. If the fever persists or the general condition of the patient indicates at the onset that puncture alone will not suffice, an arthrotomy followed by early mobilization in the strictly synovial forms yields the best results. To prevent the incision from closing, the synovial membrane should be sutured to the skin. Early mobilization can be made much less painful by the use of large injections of procaine hydrochloride into the lateral ligaments and into the insertions of the quadriceps. For the severe cases in adults, simple arthrotomy must yield to more radical methods. The authors warmly recommended the drainage operation employed in war injuries of the knee; i. e., removal of the patella, resection of the ends of the femur and tibia, and synovectomy. The same methods were recommended for children, with the exception that early mobilization could not be carried out so easily.

SURGERY OF THE SUPRARENALS

On the third subject the paper prepared by Leibovici (Paris) and Stricker (Mulhouse) constitutes a monograph, which will be a landmark in this rapidly developing field of surgery. The authors believe that one is justified in predicting some very gratifying results following operations for benign tumors of the medullary portion (hypertension syndrome) or of the cortical portion (genitosuprarenal syndrome).

Operative intervention for malignant tumors has not been successful. The technic is difficult, the immediate mortality high and recurrence frequent, taking place earlier in tumors of embryonal character. Malignant tumors are also commonly bilateral. Suprarenalectomy is of no value in epilepsy. In certain cases of hypertension, especially those of paroxysmal type and those of the menopause, some brilliant results have been reported. But there have also been some failures in hypertension cases.

In thrombo-angiitis obliterans (Buerger's disease) of the extremities, suprarenalectomy is indicated in cases in which the vessels are still permeable, capable of vasodilatation. Lumbar sympathectomy offers a better prognosis in these cases than suprarenalectomy. Too few patients with Raynaud's disease have been operated on to enable one to draw any conclusions. Denervation of the suprarenals for hyperthyroidism seems to have a favorable action in lowering the basal metabolism rate, especially for cases not benefited by repeated thyroidectomies.

OPERATIVE TREATMENT OF ACUTE PANCREATITIS

In their paper, Brocq and Varangot said that thus far surgery in acute pancreatitis has not been successful, because much remains obscure as to the initial causes. A rational treatment should be based on the prevention of the conditions that lead to activation of the pancreatic secretion, to check these causes when they have once begun and to combat the shock that results from them. Treatment varies according to whether one is dealing with the aseptic or the suppurative form. The former represents the real evolution of pancreatic autodigestion from the stage of activation of the trypsin within the gland itself. Death in aseptic pancreatitis seems to be due to toxemia similar to that observed in severely jaundiced patients. It would seem as though, as a result of hepatic insufficiency, certain incompletely metabolized proteins enter the circulation. The object of treatment should be to drain the pancreas, eliminate the cause of the pancreatitis, especially drainage of the biliary tract, combat the shock and intoxication and attempt to save as much as possible of the pancreas itself. The gallbladder should be drained and calculi removed, at the same time an examination of the stomach and duodenojejunal region being made if the patient's condition permits. If there is hypochloremia and hyperglycemia in addition to shock, the former should be treated by sodium chloride intravenously and the latter by insulin. In favorable cases one sees a decided improvement in from two to three weeks. Death often occurs two or three days after operation. The mortality of these aseptic cases remains between 30 and 50 per cent; perhaps with earlier operation and drainage of the biliary tract, it may be lowered.

As to the cases due to infection, a division into suppurative and gangrenous forms is very difficult. They develop rapidly in persons apparently in the best of health. One can observe the formation of a swelling in the epigastric region or palpate a deep-seated, diffuse, fixed, painful mass. At operation one finds an infected hematoma in which lie gangrenous shreds of pancreatic tissue. Unless operation is performed in these cases, death from sepsis or peritonitis occurs. In some cases the process may be walled off with recurrent febrile attacks. There is a type of suppurative pancreatitis in which the condition develops gradually, leading to the formation of an epigastric mass. The pus may burrow toward the diaphragm or appear in the lumbar region or evacuate into a hollow viscus. Early operation will avoid these complications. The prognosis is more favorable in suppurative than in acute or hemorrhagic pancreatitis.

If the gland has undergone complete destruction, the outlook is very serious. The more localized the process, the better the prognosis. The anterior mode of approach to the pancreas is the only one to be considered.

In the next paper on the surgical treatment of chronic pancreatitis, Berard and Mallet-Guy considered as amenable to operation only cases in which the inflammatory changes were primary in the pancreas. Their character, whether benign or malignant, is discernible only by the clinical behavior of the tumor; that is, if it diminishes in size, it is benign and vice versa. An eighteen months cure stamps the lesion as being of noncancerous nature. This is due to the fact, at least at the beginning of the disease, that the clinical picture of a cancer in a certain number of cases, and of a benign chronic pancreatitis, is identical. Even exploratory operation does not always enable one to make a differential diagnosis. The biliary origin of chronic pancreatitis is evident in more than half of the cases, but it is difficult to determine the route of infection. Icterus and pain are the most reliable symptoms. The jaundice is considered generally to be due to an obstruction of the

common duct; but there are cases in which one cannot find such an obstruction, and postoperative injection of iodized oil into the biliary tract also fails to reveal an obstruction. At present, the surgical treatment of chronic pancreatitis is empirical. The operation that yields the best results is drainage of the biliary tract, even when there is no demonstrable obstruction. Such a drainage can be external (cholecystostomy or choledochotomy) or internal (among the latter, anastomosis of the duodenum and common duct is not to be recommended, because of the danger of ascending infection of the bile ducts). The best results follow anastomosis of the gallbladder and stomach. External drainage operations are more likely to be successful if drainage of the gallbladder is combined with that of the hepatic duct. Chronic pancreatitis with icterus can be cured in 75 per cent of the cases, and in an even larger number if there have been no previous lesions of the gallbladder. Drainage of the common duct is even more efficacious than that of the gallbladder, but there is danger of a permanent fistula. In chronic pancreatitis without icterus, drainage of the biliary tract is of little benefit. Direct drainage of the pancreas is not to be recommended. Even if a biliary fistula develops in cases of chronic pancreatitis after drainage of the gallbladder, one can always resort to an anastomosis between the latter structure and the stomach. Even if there are evidences of duodenal compression, gastro-enterostomy is rarely indicated.

Abuse of War Pensions in France

That France also has its pension troubles is the subject of an article in a recent number of the *Siècle médical*. Jan. 1, 1933, there were about 1,181,000 persons drawing pensions. Of these, 60,143 receive an indemnity of 100 per cent and 278,000 one of 10 per cent. The total sum spent for pensions is about seven billion francs annually (nearly five hundred million dollars at the present rate of exchange). One billion francs (seventy million dollars) is spent for those having major war injuries and those who were gassed, and four billion francs (over 280 million dollars) for those who are ill or "feign illness." About one third of those who receive pensions were noncombatants, such as workers in munitions plants.

During the first years after the war, these "medical parasites," as the writer terms them, did not receive any pension at all. Following the passage of a law in 1919, pensions were allowed to every one, whether in active service or not, "on whom a disease was found, it being taken for granted that such condition had been contracted or had been made worse by the dangers, accidents or fatigues of service." Every one who had a certificate of some acute illness, no matter if only of short duration and mild in nature, issued during the war, now applies for a pension.

This situation has assumed such political importance that it will require a strong hand to control it.

MOSCOW

(From Our Regular Correspondent)

Oct. 6, 1934.

Reform of Medical Education in the Soviet Union

In May 1934 an all union conference on medical education was called at Moscow to discuss the project of reorganization of medical education. In the medical school a five year course will be organized. The first five semesters will follow a common program. In the fifth year the students are to study medicine in connection with their future specialty. In all medical schools there will be curative and prophylactic faculties, but the pediatric and hygienic courses will be given only in universities where there are enough qualified teachers. The obstetric faculty will be a part of the curative-prophylactic faculty. The faculty of physical culture will be closed, but the study of physical culture will be obligatory on every other faculty. The preparation of physicians by means of correspondence courses is annulled. Many research institutes will be united with faculties of medicine in order to make the latter centers of scientific thought. The oldest medical institutes of Moscow, Leningrad, Tomsk, Kazan, Rostov on Don and Voronecz will be reorganized as medical schools. Government examinations will be established. Persons entering faculties of medicine will have to be much better prepared than previously. Many new textbooks will be written for students. In the autumn of 1934, 9,500 new students will be received in the faculties of medicine. The number of young men desiring to receive medical education is growing.

Academician I. P. Pavlov

September 27, the eighty-fifth birthday of the physiologist Ivan Petrovitch Pavlov was celebrated by the Soviet Union. Professor Pavlov was born in the family of a priest at Riazan and received his early education in a seminary. In 1870 he went to St. Petersburg, where he attended the faculty of natural sciences and began his study of physiology under the guidance of Professor Zion. His first work, on innervation of the pancreas, published in 1874, was awarded a gold medal. After graduating at the university, he entered the military medical academy, simultaneously working as assistant to Professor Zion. He went to Germany in 1877, where he studied physiology of the gastro-intestinal tract with Professor Heidenhain. Coming home he took up research on the physiology of the blood. In 1879 he graduated from the academy but remained there for further study. He directed for ten years the experimental laboratory of the clinic of the physician Prof. S. P. Botkin. In 1884-1886 Pavlov worked abroad with Ludwig and Heidenhain. He published several papers on the pancreatic juice after returning home. He received the degree of doctor of medicine in 1883, became a private dozent in 1884 and was professor of pharmacology at the military medical academy in 1890. He was appointed to the chair of physiology in 1896, which he occupied till 1924.

In 1897 Professor Pavlov summarized the results of his work in his classic monograph "Lectures on the Digestive Glands." He was awarded for these researches the Nobel prize in 1904. In 1906 he was elected a member of the Russian Academy of Science. Professor Pavlov is a member of numerous foreign academies and scientific institutions and he has received many international prizes for his scientific work.

In 1903 in the International Congress of Physiologists in Madrid he read his well known paper on the experimental psychology and psychopathology of animals, which became the basis of a new chapter in physiology. There are hundreds of scientific reports made under the guidance of Professor Pavlov on the question of conditional reflexes, which was first developed by him.

In his two books "Twenty Years' Experience in the Experimental Study of the Higher Nervous Reactions of Animals" and "Lectures on the Work of the Cerebral Hemispheres" he gave for the first time a complete systematic statement of the theory of conditioned reflexes.

The Soviet government has always been attentive to Pavlov. In the difficult year of 1920 there was published by Lenin a special decree about the edition of Pavlov's works, which provided good working conditions for the pursuit of his scientific studies. Five years ago the government published another decree about the organization of special laboratories in the village of Coltuschi (near Leningrad) with a special building for Pavlov's work. The Council of People's Commissars of the Soviet Union in recognition of his eighty-fifth anniversary established an annual prize of 20,000 rubles for the best work in physiology and five scholarships of 500 rubles monthly each for young scientists in the field of physiology. The govern-

ment will publish in 1935-1936 all of Pavlov's works and will assign for his biologic station in Coltuschi 1,000,000 roubles yearly. A street in Leningrad will bear Pavlov's name. Talking pictures devoted to Pavlov and his research are now being made under the guidance of the pupils of Pavlov—Professors Podcopajev, Féodorov and others. The first series of pictures will be ready for the opening of the fifteenth International Physiologic Congress in the Soviet Union in August 1935.

Besides his scientific study, Professor Pavlov works every day physically and enjoys sport. In the parks of Coltuschi he plays skittles and rides a bicycle. At present he directs three large laboratories. Nearly all chairs of physiology in the Soviet Union are occupied by his pupils, many of whom are known the world over—Professors Orbeli, Bicov, Fédorov, Speransky, Rozenkov, Savitch, Frolov, Zeleni and others.

The Fifth Congress of Physiologists

The fifth All-Union Congress of Physiologists, Biochemists and Pharmacologists was held at Moscow, June 25-30. Prof. I. P. Rosenkov was elected president of the congress. About 250 papers were read at the meetings. The sections of the congress were on (1) comparative physiology, (2) physiology of nourishment, (3) biochemistry, (4) physiology of work, (5) experimental physiology and (6) pharmacology and industrial toxicology. The meeting of June 26 was devoted to the question of neurohumoral regulation. Prof. Leo A. Orbeli of Leningrad and Prof. D. E. Alpern of Kharkov read papers. June 27, three papers were read. The first one was by Prof. A. N. Palladin, who spoke on the biochemistry of muscular activity. Investigations on the influence of athletic training on the content of lactic acid in muscles demonstrated that the training causes no accumulation of lactic acid. Professor Palladin spoke about the influence of fatigue on the oxidative processes that are not immediately connected with muscular work. Prof. I. S. Beritov of Tiflis spoke on the psychonervous elements of individual behavior of the higher vertebrates. He considers behavior the total reaction of the organism, a reaction formed of the adaptation of the animal to the external medium and adaptation of the medium to the requirements of the organism. Professor Beritov refers every act of behavior to the reflexes, though the laws of the science of behavior and the science of reflexes are different. He studied the behavior of dogs by the method of free movements. The behavior of the animals based on their individual experience he calls "individual behavior." Psychology and reflexology cannot completely explain the behavior of men and animals. Professor Beritov's paper called forth many objections, mostly from representatives of I. P. Pavlov's school.

June 29 the plenary meeting of the congress was devoted to the origin of excitation and fatigue. Prof. A. A. Uchtomsky of Leningrad said that tissues and organs that do not get tired do not exist. The problem of fatigue is outgrowing physiology and is becoming a social problem of expedient organization of work. Prof. D. S. Vorontzov of Kazan spoke of the origin of excitement and demonstrated that it is closely connected with metabolism. The electrical reaction of nerve and muscle does not exceed five seconds. Prof. D. L. Rubinstein of Moscow said that the use of oscillations of low frequency currents of some hundred million oscillations in a second opens new ways of studying the activity of a living cell.

In the section of comparative physiology, Prof. S. M. Leites of Kharkov read a paper on the regulation of fat metabolism. Dr. N. F. Popov of Moscow spoke about the vegetative functions of dogs after exclusion of the central nervous system.

In the section of pharmacology, Prof. V. V. Savitch of Leningrad reported on the influence of soporifics on the intestinal secretions. Small doses of morphine depress the secretion, having no influence on the brain; barbital and paraldehyde stop the secretion of the intestine. Those observations point out the rôle of the central nervous system on the secretion of the intestine.

Professors Honored

The All Russian Executive Committee has given the title "honorary workers of medicine" to the following well known Russian professors: Prof. Serge N. Davidenkov of Leningrad, who wrote about 140 papers in neuropathology, biology and genetics; Prof. Leo A. Orbeli, who occupies the chair of physiology in the Military Medical Academy and in the All-Union Institute of Experimental Medicine; the surgeon Professor Andreas; L. Polenov, who in 1926 established the first chair of neurologic surgery in the Soviet Union; Prof. Ludwig I. Svergevsky, a specialist in ear and throat diseases and one of the best Soviet surgeons; Prof. Serge U. Spasocucotzky and Prof. George N. Speransky, a pediatrician, one of the founders of the Institute for Studying Motherhood and Childhood.

RIO DE JANEIRO

(From Our Regular Correspondent)

Sept. 15, 1934.

Indications for Roentgen Therapy in Rhinolaryngology

In a communication to the Society of Medicine and Surgery of São Paulo, Dr. P. Mangabeira Albernaz states that the two most important indications of roentgen therapy in rhinolaryngology are the papillomas of the larynx and rebellious hemorrhages. The roentgen treatment of papillomas is relatively recent and the results are spectacular. The treatment is simple and without danger if the right technic is followed. The author reports the case of a child, aged 12, with aphonia due to a papilloma of the left vocal cord. A cure was obtained and has been maintained for more than two years with irradiations of the larynx. Roentgen therapy is the method of choice for the treatment of papillomas of the larynx. Not as well known as the former procedure is the effect of roentgen rays on hemorrhages resistant to all other therapeutic means. In these cases, in which even transfusion fails, irradiation (irradiation of the hypophysis, of the spleen, of the lumbar medulla, and of the region in which the hemorrhage takes place) stops the hemorrhage suddenly. The author states that the use of roentgen rays has not only been a therapeutic measure but also a prophylaxis, under which conditions the irradiation must be done fifteen hours before the intervention. He cites the case of a child, aged 6, having a hemorrhagic diathesis of nineteen days that was diagnosed as purpura haemorrhagica. Blood examination showed 1,900,000 red cells, 10,000 leukocytes, 35 per cent hemoglobin, absence of hematoblasts, increase in the bleeding time and normal coagulation time. The polymorphonuclears were 43.5 per cent and the lymphocytes 43.5 per cent. After various treatments, tamponing, emetine, transfusion and so on, the case was given up as lost. The author advised roentgen therapy. The child was cured and has remained so for three years.

Caseation of Nerves of Leprosy

Dr. Enrico Branco Ribeiro has recently presented a well documented work to the Society of Medicine and Surgery of São Paulo on the surgical aspects of caseation of nerves in leprosy. On the basis of ten cases the author points out that in leprous neuritis the peripheral nerves increase in volume; generally this is due to a fibrosis, but rarely there is necrosis followed by caseous coagulation and later liquefaction, surrounded by granulomatous tissue with fibroblasts, collagenous fibrils, gigantocytes, lymphocytes, plasmocytes, histiocytes and newly formed vessels, but as a rule, with absence of Mycobacterium leprae.

This focus of caseation, which is found preferably in the endoneurium, passes to the epineurium and from there pro-

gresses in the direction of the superficial tissues, reaching eventually the skin surface. The author says that this is a surgical condition. He divides the cases into three groups. The first group includes those in which the caseous tumor has already pierced the skin, leaving a retractile scar that adheres to the nerve trunk and to the skin. In these cases the author does a neurolysis and envelops the reconstructed nerve with a piece of peritoneum recently collected. The second group comprises cases in which the disorder has attacked a nerve trunk at one or various points with formation of tumors. In these cases he proceeds to the dissection and extirpation of the tumors, to the incision of the nerve and to extraction of the caseous matter found in the endoneurium. The third group is composed of cases in which the disorder has attacked secondary cutaneous nerves and in which surgery cannot be conservative, the tumors being excised through section of the nerve branch above and below the affected part.

Congress of Neurology, Psychiatry and Legal Medicine

At the fourth Brazilian Congress of Neurology, Psychiatry and Legal Medicine, July 18-24, not less than thirty-eight papers on neuropsychiatry and legal medicine were presented and discussed. These contributions put up in a volume will give proof of the activity of the disciples of Juliano Moreira, Franco da Rocha, A. Austregésilo and Henrique Rôxo, who have done so much to exalt the level of national medical culture.

Personals

Drs. Antonio Fontes and Valois Souto have been named by the government as representatives of Brazil at the tuberculosis conference in Warsaw.

JAPAN

(From Our Regular Correspondent)

Sept. 29, 1934.

The Abolition of Titles and Degrees in Advertisements

The Medical Association of the Western Provinces recently passed a resolution in its annual meeting to propose to the government the abolition of medical titles and degrees in advertisements or signs of any kind, for the following reasons: First, the present medical law prohibits the use of any kind of doctors' degrees in their advertisements. Second, generally speaking, the titles and degrees are conferred for theses on fundamental research and not for clinical work. The bearers are apt to use them in advertising their clinical skill. Third, there are too many who abuse their degrees, such as lending them to others or in advertising "patent medicine" and quack treatments. The new minister of education, considering it to be his great mission to reform the whole educational system, has put his hand to this work of reformation. He has taken up the question of titles and degrees, together with the question of shortening the number of school years as a whole. It is expected that a bill embodying the proposed reforms will be presented during the coming winter session of the diet. The government, it is believed, will support the bill, as there are many communities that support it.

The Regulation of Quackery

The rapid increase of medical impostors using various kinds of instruments, which they call their own invention, has forced the home office to issue new general regulations. An official committee was organized for this purpose, and at its first meeting the metropolitan police board issued the following reports: There were in Tokyo in August 4,473 lay practitioners. Almost half of them engage in what they call "electrohealing." Official control over them has not been strict because the methods ten years ago were quite simple and not believed to be harmful. It was not, therefore, regarded as a violation of the medical act. But in 1929 the government declared some of them to be a kind of medical practice and forbade charlatans to use ultraviolet rays, high frequency current and the roentgen rays. In proportion to the increase in quacks, the manufacture of lamps and electrotherapeutic instruments increased, and many invalids were taken advantage of. The national health has come to be threatened by these harmful devices. A surprising fact is that there came to be a school of what is called electrohealing. It is not a school in its true sense, yet dares to assume this title. A flourishing school of this kind is said to have sent out more than 2,000 persons, who finished their course all over the country within a few years. The intelligent unemployed, who are everywhere at present, are ready to enter such a school. The course is usually six months, or a year and a half at the longest. After the students have paid a large school fee and bought an instrument of the school's own design at a high price, the queer title of "master of electrohealing" is conferred and they start their practice. Healers who use various rays are next in number. Palm therapy flourished widely a few years ago, but at its zenith a famous peer fell a victim of it. This caused a great sensation and led to this therapy being prohibited on sick people, and now it is allowed only to promote health and not healing. The new regulations are expected to cut the number of lay practitioners to two thirds when it is enforced.

Microbiologic Research Institute

The official gazette of September 17 says that a new microbiologic research institute has been established in connection with the Osaka Imperial University. There has been only one institute in Japan of this kind, the Infectious Disease Research Institute in Tokyo, which is chiefly devoted to studies of microbiology and to the manufacturing of preventive vaccines. Osaka is often called the gateway of infectious diseases from abroad, and so it will be more convenient for this kind of work than Tokyo. The new institute will study chiefly leprosy, tuberculosis, bacteriology and the prevention of epidemics. It will deal with infectious diseases that are closely connected with the surgical, internal and dermatologic departments. The first chief is Prof. Dr. Yashiro Furutake of the medical department of the university. Drs. Taniguchi, Satani, Imamura, Hosokawa and Sakurai, who are professors and assistant professors of the university, are on the staff. It will be completed in 1939 and the annual expenditure is expected to amount to over 330,000 yen. A large building will have been built by that time.

Kitazato Memorial Library

It is three years since the late Baron Dr. Shibasaburo Kitazato passed away. In order to commemorate his achievements and services in the progress of medical science, a plan for establishing a medical library has been made public by his friends. This will be the first library of medicine in this country. The sum of 300,000 yen will be contributed for the expenses of construction by the people at large. The chief of the committee is Baron T. Yamamoto, ex-minister of home affairs.

A New Medical College

It has been officially announced that a new medical college will be attached to the Formosa Imperial University at Taiwan and will open in 1936. Construction will be begun next year. Prof. Dr. S. Mita of the Tokyo Imperial University, a member of the organizing committee, will be appointed director, and twenty-four professors will be selected from various places by 1940, when the work will be completed. The present medical school in Formosa will be raised to the status of a university college of medicine. This will be the second medical college in Japanese territory.

Marriages

NORMAN BERNARD MURPHY, Augusta, Maine, to Miss Harriet Madeline Colgan of Mattapan, Mass., in September.

THOMAS BLACKBURN PAYNE, Fredericksburg, Va., to Miss Virginia Garnett at Gwynedd, Pa., October 20.

HARCOURT ALEXANDER MORGAN JR., Knoxville, Tenn., to Miss Sara Stone of Union City, August 9.

PIERRE G. JENKINS to Miss Emily Sinkler Martin, both of Charleston, S. C., at Florence, October 15.

JEFFERSON ALBRIGHT JONES, Philadelphia, to Miss Mildred Wolfe at Valley Forge, Pa., September 29.

PHILLIP P. PEASE, Chardon, Ohio, to Miss Marion Johnson of Middlefield, at Erie, Pa., October 5.

EDMUND LUDLOW KEENEY to Miss Eleanor Seymour Zimmerman, both of Baltimore, October 27.

GEORGE KENDAL DAZEY, Santa Monica, Calif., to Miss Doris Schwuchow of Los Angeles, October 11.

JAMES MITCHELL PARKER, Boston, to Miss Elizabeth Harding of Chestnut Hill, Mass., September 21.

MAYNARD F. POLAND, Indianapolis, to Miss Elwanda Phillips of Dunkirk, Ind., October 7.

OLIVER JOSEPH MENARD, Springfield, Mass., to Miss Janet T. Moran of Boston, November 7.

LORAINE WILLIAM WARD, Fairbank, Iowa, to Miss Grace Edwards of Blairstown, recently.

FRANK S. PECKOSH, Oxford Junction, Iowa, to Miss Collete Hart of Lost Nation, recently.

DOMINIC ZITO, Flushing, N. Y., to Miss Margery Armitage of New York, September 22.

HOWARD C. SPARKS, Monroeville, Ohio, to Miss Mary Shondel of Ottawa, recently.

ARTHUR CUNO FRANK ZOBEL to Miss Beatrice Wilson, both of Johnstown, Pa., June 7.

GEORGE E. STAFFORD, Salina, Kan., to Miss Mary Greenwald at Falls City, Neb., July 5.

FRANCIS I. TAYLOR, Altoona, Pa., to Miss Elizabeth Hepler of Meadville, May 22.

ARTHUR E. PERLEY, Quincy, Ill., to Miss Ruth Buss in September.

Deaths

Lewis Linn McArthur ✠ Chicago; Rush Medical College, Chicago, 1880; member of the Colorado State Medical Society and the Society of Clinical Surgery; member and past president of the American Surgical Association; member and formerly chairman of the American section, International Surgical Congress; past president of the Chicago Medical Society; fellow of the American College of Surgeons; since 1886 chief surgeon to St. Luke's Hospital and consulting surgeon to the Michael Reese Hospital; consulting surgeon to the Grant and Evanston (Ill.) hospitals; was commissioned a major in the Medical Reserve Corps in 1917 and director of Base Hospital, number 14; Chevalier of the Order of Leopold of Belgium; aged 76; died suddenly, November 5, of heart disease.

Eugene R. Carpenter, Dallas, Texas; Jefferson Medical College of Philadelphia, 1898; member of the State Medical Association of Texas; past president of the El Paso County Medical Society; member of the American Academy of Ophthalmology and Oto-Laryngology; fellow of the American College of Surgeons; on the visiting staffs of the Baylor, Methodist and Parkland hospitals; retired with the rank of captain in the U. S. Army; aged 61; died, October 9, in a local hospital.

Fulton Schuyler Vrooman, London, Ont., Canada; University of Toronto Faculty of Medicine, 1904; member of the American Psychiatric Association; associate professor of psychiatry, University of Western Ontario Medical School; served with the Canadian Army Medical Corps during the World War; superintendent of the Ontario Hospital; aged 52; died, July 10, in the Victoria Hospital, following an operation for appendicitis.

Howard Perry Bellows, Boston; Boston University School of Medicine, 1877; professor emeritus of otology, professor of physiology, 1877-1885, and professor of otology, 1886-1929, at his alma mater; fellow of the American College of Surgeons; consulting aurist to the Massachusetts Memorial Hospitals and Westboro (Mass.) State Hospital; aged 82; died, October 16, at his home in Cambridge.

William H. Van Gieson, Bloomfield, N. J.; College of Physicians and Surgeons, Baltimore, 1886; vice president and for seventeen years member of the board of education; aged 69; for many years on the staff of the Mountainside Hospital, where he died, September 7, of injuries received when he fell over a rock, while at his summer home in Boothbay Harbor, Maine.

John Randolph Garrett ✠ Roanoke, Va.; University College of Medicine, Richmond, 1898; member of the American Academy of Ophthalmology and Oto-Laryngology; fellow of the American College of Surgeons; on the staff of the Roanoke Hospital; aged 65; died, August 28, in the Jefferson Hospital, of uremia and hypertrophy of the prostate.

Jacob Lincoln Schoch, New Ulm, Minn.; University of Michigan Medical School, Ann Arbor, 1885; an Affiliate Fellow of the American Medical Association; member of the state board of medical examiners, 1891-1896; aged 71; on the staff of the Loretto Hospital, where he died, September 22, of pulmonary thrombosis and pleurisy.

Thomas Kelly Van Zandt, Louisville, Ky.; Kentucky University Medical Department, Louisville, 1902; at one time adjunct professor of obstetrics, University of Louisville School of Medicine; on the staffs of the Norton Memorial Infirmary and St. Anthony's Hospital; aged 59; died, September 16, of cerebral hemorrhage.

Edward Andrew Tracy, Keene, N. H.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1902; member of the New Hampshire Medical Society; served during the World War; aged 57; on the staff of the Elliot Community Hospital, where he died, September 2, of peritonitis, following an operation.

Alfred Forbes Blackhall, Schenectady, N. Y.; University of Vermont College of Medicine, Burlington, 1918; member of the Medical Society of the State of New York; fellow of the American College of Surgeons; on the staff of the Ellis Hospital; aged 39; died, October 24, of embolus following multiple fractures.

Leonard Ernest Neale, Baltimore; University of Maryland School of Medicine, Baltimore, 1881; professor emeritus of obstetrics at his alma mater; member of the Medical and Chirurgical Faculty of Maryland; fellow of the American College of Surgeons; aged 75; died, October 19, of heart disease.

John Alexander MacArthur, Winnipeg, Manit., Canada; McGill University Faculty of Medicine, Montreal, Que., 1885; professor of diseases of children, University of Manitoba Faculty of Medicine; on the staffs of the Winnipeg General Hospital and St. Boniface Hospital; aged 86; died, August 26.

Charles Wardsworth Wright, Longmeadow, Mass.; University of the City of New York Medical Department, 1888; member of the Massachusetts Medical Society; served during the World War; on the staff of the North Adams (Mass.) Hospital; aged 70; died, September 25, of uremia.

Frank A. Metcalfe, Chicago; Hahnemann Medical College and Hospital, Chicago, 1897; formerly professor of materia medica and internal medicine at his alma mater; on the staff of the Jackson Park Hospital; aged 61; died, October 20, of essential hypertension and cerebral thrombosis.

Harry Parker Thompson, Brookville, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1890; member of the Medical Society of the State of Pennsylvania; on the staff of the Brookville Hospital; aged 72; died, September 23, in the Cleveland (Ohio) Clinic Hospital, of hepatitis.

Samuel C. Broadstreet ✠ Mount Pleasant, Texas; University of Louisville (Ky.) School of Medicine, 1888; past president and secretary of the Titus County Medical Society; aged 70; died, October 12, in the Paris (Texas) Sanitarium, of disease of the prostate and pyelonephritis.

Frederick Augustine Rupp, Lewistown, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1900; member of the Medical Society of the State of Pennsylvania; formerly member of the board of health of Lewistown; served during the World War; aged 58; died, July 23.

John Allen Thames, Jackson, La.; Tulane University of Louisiana Medical Department, New Orleans, 1908; member of the Louisiana State Medical Society; superintendent of the East Louisiana State Hospital; aged 52; died suddenly, September 30, at Harvey, of heart disease.

John Albert Boger ✠ Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1889; fellow of the

American College of Surgeons; for many years police surgeon; on the staffs of the Episcopal, Stetson and St. Mary's hospitals; aged 65; died, October 20.

Christopher Hamilton Tebault Jr., New Orleans; Tulane University of Louisiana Medical Department, New Orleans, 1895; member of the Louisiana State Medical Society; veteran of the Spanish-American War; aged 66; died, September 4, of carcinoma of sigmoid and rectum.

David **Thomas Tayloe Jr.** ✠ Washington, N. C.; University of Pennsylvania School of Medicine, Philadelphia, 1919; fellow of the American College of Surgeons; aged 40; connected with a hospital bearing his name, where he died, September 14, of edema of the brain.

Eugene L. Evins, Wilburton, Okla.; Tulane University of Louisiana Medical Department, New Orleans, 1892; member of the Oklahoma State Medical Association; aged 69; died, August 31, in St. Mary's Infirmary, McAlester, of acute empyema of the gallbladder.

Charles M. Braidwood, Imlay City, Mich.; Detroit College of Medicine, 1900; member of the Michigan State Medical Society; past president and secretary of the Lapeer County Medical Society; aged 59; died in October at Port Huron, of valvular heart disease.

John Albert Williams ✠ Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1892; aged 67; on the staff of the Ohio Valley General Hospital, McKees Rocks, where he died, September 20, of diabetes mellitus and tuberculosis of the lungs.

Harmon Silas Trueman, Medford, Mass.; University of Pennsylvania School of Medicine, Philadelphia, 1880; member of the Massachusetts Medical Society; aged 76; died, September 1, in the Trull Hospital, Biddeford, Maine, of coronary occlusion.

William Smith O'Brien, Chicopee, Mass.; Tufts College Medical School, Boston, 1905; formerly member of the board of health and school committee; on the staff of the Mercy Hospital, Springfield; aged 53; died, September 3, of heart disease.

William F. Farley ✠ Holden, W. Va.; University of Louisville (Ky.) School of Medicine, 1893; past president of the Logan County Medical Society; medical superintendent of the Holden Hospital; aged 68; died, September 26, of myasthenia gravis.

Leander D. Keith, Anna, Ill.; Hospital College of Medicine, Louisville, Ky., 1896; member of the Illinois State Medical Society; aged 69; died in October as the result of a fall from a third story window of the Missouri Baptist Hospital, St. Louis.

William Minor Bryan ✠ Senior Surgeon, U. S. Public Health Service, Charlottesville, Va.; University of Virginia Department of Medicine, Charlottesville, 1906; aged 52; died, October 5, of angina pectoris and coronary sclerosis.

Edward L. C. Richter, St. Louis; Beaumont Hospital Medical College, St. Louis, 1897; member of the Missouri State Medical Association; formerly coroner and alderman; aged 66; died, September 6, of cerebral hemorrhage.

Starr Clarence Hollis ✠ Adams, N. Y.; Syracuse University College of Medicine, 1900; health officer for thirty-four years; served during the World War; aged 56; died suddenly, September 10, of coronary occlusion.

Willis Rollin Congdon, Santa Cruz, Calif.; Rush Medical College, Chicago, 1889; member of the California Medical Association; aged 66; died, August 18, of bronchopneumonia, chronic pyelitis and chronic myocarditis.

Edwin James Glass Valentine, Jersey City, N. J.; New York Homeopathic Medical College and Hospital, 1894; formerly member of the county board of health; aged 64; died, August 27, of aplastic anemia.

John Preston Ferguson, Louisville, Ky.; Jefferson Medical College of Philadelphia, 1892; member of the Kentucky State Medical Association; aged 68; died, October 8, of cerebral hemorrhage.

Frank C. Robinson, Little Rock, Ark.; Arkansas Industrial University Medical Department, Little Rock, 1896; member of the Arkansas Medical Society; aged 71; died, September 19.

John Angelo Lester, Nashville, Tenn.; Meharry Medical College, Nashville, 1895; emeritus professor of physiology at his alma mater; aged 69; died, September 27, of carcinoma of the prostate.

Lewis E. Robinson, Magee, Miss.; Memphis (Tenn.) Hospital Medical College, 1899; member of the Mississippi State Medical Association; aged 64; died suddenly, October 2, of heart block.

Harry Willrich Oyer, Pittsburgh; Jefferson Medical College of Philadelphia, 1893; member of the Medical Society of the State of Pennsylvania; died, August 2, in Toronto, Ont., Canada.

Silas Woodson Nossaman, Cunningham, Kan.; University Medical College of Kansas City, 1902; aged 60; died, September 15, in the Wesley Hospital, Wichita, of appendicitis.

Ralph L. Hoyt, Christiana, Pa.; Baltimore Medical College, 1898; member of the Medical and Chirurgical Faculty of Maryland; aged 58; died, October 2, of heart disease.

Samuel Yoffe, Chicago; Chicago College of Medicine and Surgery, 1916; aged 44; died, October 19, in the University of Pennsylvania Hospital, Philadelphia, of pneumonia.

Thomas Mason Staley ✠ Bicknell, Ind.; Baltimore Medical College, 1903; served during the World War; aged 55; died, September 28, of chronic valvular heart disease.

Robert Alexander Twitchell, East St. Louis, Ill.; American Medical College, St. Louis, 1890; member of the Illinois State Medical Society; aged 77; died, September 21.

Jean Baptiste Delisle, Ottawa, Ont., Canada; Laval University Faculty of Medicine, Quebec, 1892; aged 72; died, August 11, in the Notre Dame Hospital, Montreal.

Warren Smith, Holland, Mo.; St. Louis College of Physicians and Surgeons, 1898; aged 62; was instantly killed, October 8, when he was struck by an automobile.

Robert McAdam, Hot Springs National Park, Ark.; Hahnemann Medical College and Hospital, Chicago, 1885; aged 85; died, July 24, of chronic nephritis.

Frank Thomas Roach, Newport, Mich.; University of Michigan Medical School, Ann Arbor, 1903; aged 56; died, October 17, of carcinoma of the stomach.

Charles Henry Gibbs, Ellsworth, Maine; Medical School of Maine, Portland, 1881; member of the Maine Medical Association; aged 83; died, August 27.

William Rockwell, River Hebert, N. S., Canada; Jefferson Medical College of Philadelphia, 1886; aged 75; died, September 28, of coronary thrombosis.

Uriah H. Farr, Paragon, Ind.; Indiana Medical College, Indianapolis, 1877; Civil War veteran; aged 87; died, October 2, of cardiorenal disease.

Jesse Mead Titterington, Marionville, Mo.; Nashville (Tenn.) Medical College, 1878; aged 79; died, September 15, of valvular insufficiency.

Zebulin Monroe Hampton, Centralia, Mo.; Marion-Sims College of Medicine, St. Louis, 1891; aged 77; died, October 3, of cerebral thrombosis.

Francis M. Siner, Terre Haute, Ind.; Central College of Physicians and Surgeons, Indianapolis, 1884; aged 72; died, October 5, of uremia.

Aubrey Taylor Fuller, Vancouver, B. C., Canada; McGill University Faculty of Medicine, Montreal, Que., 1901; aged 59; died, July 15.

George B. Borgelt ✠ St. Louis; Missouri Medical College, St. Louis, 1890; aged 70; died, October 21, of carcinoma of the liver.

John Thomas Vick, Wichita Falls, Texas; Gate City Medical College, Dallas, 1903; aged 72; died suddenly, September 17.

Preston Work Foote, Rosenberg, Texas; Hospital College of Medicine, Louisville, Ky., 1880; aged 75; died recently of uremia.

Homer John Tillotson, Los Angeles; College of Physicians and Surgeons, Baltimore, 1880; aged 77; died, September 3.

James Henry Anderson, Union City, Mich.; University of Michigan Medical School, Ann Arbor, 1888; died, September 1.

Frank G. Jackson ✠ Muncie, Ind.; Louisville (Ky.) Medical College, 1894; aged 75; died, October 5, of heart disease.

Jerome Butz Weida, Philadelphia; University of Vermont College of Medicine, Burlington, 1883; died, August 29.

Alba Lee Smith, Detroit; Detroit College of Medicine, 1912; aged 44; died, September 30, of biliary cirrhosis.

Moses Hawkins Topping, Los Angeles; Louisville (Ky.) Medical College, 1896; aged 59; died, September 19.

Ernest C. Blanck, Park Ridge, Ill.; Jenner Medical College, Chicago, 1907; aged 72; died, October 10.

Correspondence

NEED OF DERMATOLOGISTS FOR DEEPER KNOWLEDGE OF ALLERGY

To the Editor:—In THE JOURNAL, October 27, page 1275, Dr. Coca begins his paper with the statement "If one should inquire which of the existing medical specialties would profit especially through a deeper knowledge of allergic disease, one would necessarily think first of dermatology."

On page 1277 Dr. Coca says: "I have treated three patients according to Sulzberger's plan, all of which were much more sensitive by skin test to oidiomycin than to trichophytin. One of the three, a traveling salesman with large lesions on both forearms and elsewhere on the body, was unable to take the injections regularly and during the few months of his treatment his skin sensitivity remained stationary and his local condition remained unchanged. This case was later seen to be one of psoriasis."

The last sentence would seem to indicate that the need of the dermatologist for a deeper knowledge of allergy is equaled only by the need of the allergist for a deeper knowledge of dermatology.

JAMES H. MITCHELL, M.D., Chicago.

TANNIC ACID TREATMENT OF BURNS

To the Editor:—The other day, while leafing through the July issue of the *Country Gentleman,* I noted an article by Paul De Kruif expounding, in extravagant language, the discovery, by Davidson of the Henry Ford Hospital staff, of the efficacy of 5 per cent tannic acid lotions in cases of extensive burns. May I, apropos of this, quote the following paragraph from the *Pittsburgh Medical Review* of May 1890, page 170:

TANNIN IN THE TREATMENT OF BURNS

A correspondent of the *Pharmceutische Zeitung,* speaking from his own experience, says that tannin cannot be too highly recommended as an application to burns, especially when very extensive, the skin being entirely removed. A 5 per cent solution is squeezed from a sponge over the denuded surface, which is then dressed with soft ointment, either with or without tannin. Pain immediately abates, and the healing process is wonderfully rapid. The tannin solution must, of course, be freshly applied as often as the dressing is renewed.—(Dixie Doctor.)

J. A. HAGEMANN, M.D., Pittsburgh.

THE PARENTERAL ADMINISTRATION OF CEVITAMIC ACID (ASCORBIC ACID) SOLUTIONS

To the Editor:—The ready availability of cevitamic acid (ascorbic acid) in pure crystalline form has naturally suggested its parenteral administration in solution in acute scorbutic conditions (Schultzer, Paul: *Lancet* **2**:589 [Sept. 9] 1933. Bauke, E. E.: *München. med. Wchnschr.* **81**:1240 [Aug. 10] 1934). In order to prevent untoward local reactions from such administration, which may be attributed to the drug, certain pertinent factors should be called to the attention of physicians.

Cevitamic acid is a relatively strong acid and on dissolving in water yields a solution of low p_H value (about 3.4). Its acid solution injected intravenously would be partially neutralized by the buffer alkalis of the blood, but on subcutaneous, intramuscular or intradermal injection such neutralization might not be quick enough to prevent the sclerosing effect of a strong acid solution. We have observed skin sloughs in mice, rats, guinea-pigs and rabbits, within three hours after subcutaneous injection of 0.5 cc. of 5 per cent solution of cevitamic acid, and after intradermal injection of 0.05 cc. of 2 per cent solution. No local reactions occur if the cevitamic acid solution is neutralized with sodium bicarbonate just before such administration.

It is recommended that, if cevitamic acid is to be administered parenterally, it be dissolved in sterile water and neutralized with one-half its quantity of sodium bicarbonate (yielding a solution about p_H 7.0) immediately before injection so that untoward local reactions may be avoided. The dissolving and neutralizing should be done just before administering, as otherwise there may be loss of effectiveness.

B. H. FISHER, B.S.,
CHAUNCEY D. LEAKE, PH.D.,
From the Pharmacological Laboratory, University of California Medical School. San Francisco.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

OBSTETRICS IN RURAL PRACTICE

To the Editor:—In view of the considerable discussion concerning the care of obstetric patients I desire to present, for your criticism, the following case. In particular, I desire your opinion concerning the conservative attitude during the first and second stages, and the manner in which the third stage was handled. Obstetric textbooks are not clear on the matter of how long a retained placenta may be left alone, but I have heard an outstanding obstetrician say that forty-eight hours would be a safe limit. Of course, spending eighteen hours at the bedside of a woman in labor is most inconvenient—and economically a loss—to the physician, but, to my mind, it is about the only safe way, at least in country practice. All too frequently a mother "speeds up" if the physician leaves and delivers unexpectedly. The use of solution of pituitary is dangerous, and forceps should be used most rarely. I would appreciate your opinion on these points also.

Since the majority pay little or nothing (the patient cited has never paid me a cent), a physician cannot afford to handle many else he would go into bankruptcy from neglecting paying patients while absent on his maternity calls. Is there any method of "speeding up" a delivery that is perfectly safe to both mother and child? I would rather spend twenty-four hours at the bedside than run even a risk of killing either, or, for that matter, of even causing avoidable damage to the birth canal or infant. Perhaps the best solution would be to hospitalize all rural obstetric cases. In my own little practice I have, during the past year, refused all "last minute" materntiy calls; I mean those who have neglected at least reasonable antepartum care. I have done this not only for my economic protection but also because I feel that such action in this state is necessary to train the public in the matter of antepartum care. Many of the counties provide visiting nurses, and the state pays a small fee to the physician who cares for the indigent mother. If the physicians continue to answer "last minute" calls the people will continue to neglect antepartum care and the efforts of the state and of medicine will be counteracted.

RURAL PRACTITIONER, New York.

AN OBSTETRIC CASE

A white woman, aged 38, a housewife and business woman, a primipara, had been given antepartum care by her own physician. Pregnancy was uneventful. Abdominal flatulence had recurred for years regardless of treatment. Labor began at the thirty-sixth week, according to the menstrual history. A physician who had never even heard of the patient was called in the absence of the engaged physician at 2: 30 a. m.

First Stage (sixteen and one-half hours): According to the history at the bedside, the membranes had ruptured spontaneously, with frequent expulsion of small quantities of fluid, after the first half hour. The physician was called after four hours. At four and one-half hours, palpation was practically impossible because of abdominal distention. The cervix, by rectal examination, was one fourth dilated; the fetal heart rate was 160, in the left lower quadrant. Pains of from fifteen to forty-five seconds' duration occurred at average intervals of from five to six minutes, moderately strong, from four and one-half to ten and one-half hours and from twelve and one-half to sixteen and one-half hours, a two hour relatively quiet interval between. At the ninth hour aseptic vaginal examination revealed the cervix two thirds dilated; the fetal head was in left occipito-anterior presentation and no disproportion was evident. At the twelfth hour sodium amytal, 1½ grains (0.2 Gm.), was administered. At the end of the first stage the patient was somewhat tired but the pulse was good.

Second Stage (three and one-quarter hours): The beginning was judged by increased strength and frequency and the bearing-down character of the pains. After one hour the head was on the perineum. Pains were fairly strong, with a duration of thirty seconds, at intervals of from one to one and one-half minutes. At the end of two and one-half hours (one and one-half on the perineum) there was progress, but little on vulval inspection. The use of low forceps was considered. At two and three-quarter hours there was progress. At three and one-quarter hours spontaneous delivery occurred of an 8 pound 4 ounce (3,741 Gm.) infant in left occipito-anterior presentation. There was practically no bleeding.

Third Stage (about twenty-eight hours): No bleeding occurred and there were no pains. The abdomen was greatly distended and tympanitic;

palpation was practically impossible. There were sounds suggestive of a fetal heart with a rate of 164 in the left upper quadrant and what might be a fetal head or partially contracted fundus was indefinitely palpable in the right upper quadrant just above the level of the umbilicus. The abdomen was massaged frequently for two and one-half hours; large quantities of gas were expelled by the mouth and rectum; no bleeding occurred and there were no pains. The patient was tired. The possibility of the presence of a twin was considered. The cord stump and the vulva were protected by sterile dressings. The physician left (after eighteen and a quarter hours with the mother, except for a two hour interval during the first stage) with directions for immediate call if developments occurred during the night.

The night was uneventful; the mother was comfortable. Distention continued. There were no fetal heart sounds. The abdomen was massaged, without results. At 11: 45 a. m., fluidextract of ergot, U. S. P., 15 drops, was administered. At 3 p. m. there were a few vague uterine pains. At 4 o'clock the ergot, 15 drops, was repeated. At 7 o'clock there were still no pains; the patient had passed about 30 cc. of blood. A modified Credé expulsion was attempted without success; the abdomen was very tender. The physician requested consultation (for anesthesia and manual removal of the placenta). At 9: 30 p. m. the distention was markedly reduced. A semisoft uterus was palpable one fingerbreadth below the umbilicus, with a hard ring transversely across the lower segment. Under ether anesthesia, with full aseptic preparations, an intact placenta was expressed. Solution of pituitary 0.5 cc. was administered. The posterior vaginal wall was sutured. The fundus was well contracted. The physicians left at 11: 40 p. m.

Puerperium: On the second day the patient was comfortable. The temperature was 100.4 F. A cathartic was ordered.

On the third day the patient was feeling well. The temperature was 101, the pulse 84 and good. In the evening the temperature was 104.2. Orders were given for fluids, alkaline drinks, a cathartic, a light diet and no visitors.

On the morning of the fourth day the patient was feeling well. The temperature was 102, the pulse 84 and good. The breasts were normal. There was a thick yellow-brown vaginal discharge. Orders were given for a fluid diet, low vaginal irrigations with corrosive mercuric chloride 1: 1,000, and removal of the infant from the breast. The afternoon temperature was 102.4. The patient complained of flatulence and discomfort. Orders were given for elevation of the head of the bed and insertion of a rectal tube.

On the fifth day the patient was feeling well. The temperature was 100.8, the pulse 90 and good.

On the sixth day the patient was feeling well. The temperature was 100, the pulse 81 and good.

On the seventh day the patient was feeling well. The temperature was 100, the pulse 81 and good. Orders were given for a soft diet.

On the eighth day the patient was feeling well. The temperature was 99, the pulse good.

On the ninth day the patient was feeling well. The afternoon temperature was 98, the pulse 81 and good. Lochia was moderate. Orders were given permitting a few visitors and a moderate diet.

On the tenth day the mother was not visited. No telephoned reports were received.

On the eleventh day the patient's condition was very good. The afternoon temperature was 98.4, the pulse 74 and good. Abdominal distention was only moderate. The fundus was not palpable. The breasts were normal. Orders were given for a regular diet and sitting up in bed.

On the twelfth day the patient's condition was very good.

On the thirteenth day the patient's condition was very good. Orders were given that the patient might be out of bed gradually and might be up and dressed on the fifteenth day. The mother was discharged, with orders to report at the office for postpartum examination after six weeks. She has never reported.

Note: The breasts were permitted to dry, supported, as repeated attempts to nurse the infant resulted in gastric upsets. On the twelfth day a diagnosis of pyloric stenosis was made. It responded to gruels (the father refused to administer atropine, and later gruels and preferred condensed milk). The patient was apparently normal after the fifteenth day. She was discharged conditionally, on the twentieth day.

ANSWER.—1. It is scientifically and ethically wrong and economically unfair for any one to speed up a labor to save his own time, for his own convenience or to increase his fee. Without doubt the continued high maternal mortality in the United States and other countries, where such a practice is growing, under various alibis, is in part due to such interference with the natural processes of labor. The use of pituitary and of quinine, the routine rupture of the membranes, and other procedures are responsible for a certain percentage of the mortality of the new-born and of puerperal infection in addition to the damages which the cervix, the pelvic floor and the baby's brain so often suffer.

2. It is probable that an imbalance between the sympathetic and the autonomic innervation caused the prolonged first and second stages, and this might also explain the uterine inertia of the third stage. In such cases atropine might have hastened the labor. A low forceps operation on this patient, after the head had been down on the pelvic floor for one or two hours, would have been justifiable.

3. Regarding the third stage, some difference of opinion exists as to whether a placenta should be left in the uterus, that is in the absence of hemorrhage of course, for any extended period of time. Ramsbotham relates a case in which the placenta never came away and was either absorbed or discharged piecemeal in the lochia.

Polak in 1922, in cases of retained placenta, advised tamponade with washed iodoform gauze, leaving it in place for from twenty-four to thirty-six hours, and others, usually older authors, have said that there is no hurry about removing the placenta, in the absence of hemorrhage; but this was in the days when manual removal of the placenta was attended with great danger from infection.

Nowadays it is considered better practice to empty the uterus, at least before three hours has passed. Aseptic and antiseptic preparation, rubber gloves and relaxing anesthetics render this operation safe.

Years ago there were many cases of incarcerated placenta following the administration of ergot. This practice therefore was discarded. The amount administered here probably would not have caused stricture of the uterus. Pituitary occasionally acts in the same way as ergot by incarcerating the placenta but not sufficiently often to contraindicate its administration.

4. As for the economic aspects of long obstetric cases, it is notorious that obstetrics is the hardest, most time consuming and least remunerative specialty in all medicine. Perhaps the doctors themselves are to blame for permitting this state of affairs. In the cities the question of caring for the indigent or middle class is easily settled by sending the patient to a hospital, although in many hospitals the service is no better and not as safe as the woman can obtain in her own home if her case is properly managed. Nowadays the automobile has annihilated distances and it would take a man less time to reach a patient 30 miles from his office than it used to require to go 8 miles in the days of the buggy.

Presupposing that a woman has been given proper antepartum care and goes into her labor in good health and that no indication of complications can be detected at the first thorough examination, medical and obstetric, a patient is probably safer in the hands of nature alone than in the hands of those who speed up cases with pituitary, quinine and rupture of membranes. But this is not an argument for reducing the amount and quality of medical care rendered a woman during labor. Civilization has increased the pain and perils of childbirth. We should always strive toward the ideal, and this means at least two physicians and one trained nurse and a perfect maternity hospital. Such attention is economically impossible for the majority of women and it is comforting to know that, with the aid of nature and employing all the knowledge that modern science has given the obstetrician, he can obtain thoroughly satisfactory results with the means at his disposal if he is willing to make the effort to use them.

5. Regarding the refusal to attend last minute maternity calls, it is always the best practice to answer every maternity call that comes in. Educating the public must be done by example, by word of mouth, by pamphlets and leaflets, and in similar ways, always remembering that one has to keep hammering all the time and that progress is slow.

ERYSIPELAS

To the Editor:—A man, aged 27, a butcher, at the age of 15 suffered an infection of the left hand, which required an incision and drainage and which left him with contraction of the tendons of the fourth and fifth fingers of the left hand. Since then every few years he gets attacks of lymphangitis associated with chills and fever. The area of redness starts from a slight abrasion of the finger and extends as a rule to the shoulder and is accompanied by axillary adenitis. Two years ago this eruption spread from the hand to the back of the thorax. At that time he was very ill, and at first a diagnosis of sepsis was made. He was given two blood transfusions, which did not stop his chills or high fever and spread of the eruption. The diagnosis was then changed to that of erysipelas migrans. He was given two injections of erysipelas serum, which immediately cleared up his condition. This year he again suffered an attack, which began on the same hand as a lymphangitic condition with tender palpable glands in the axilla, and severe chills with a temperature of 103, and which spread next day to the back of his thorax, the area of redness being located below the angle of the scapula to the costal margin and to the spine. He was again given an injection of erysipelas serum, which was repeated in twenty-four hours, and the condition immediately cleared up. But four days later he developed a severe urticarial rash, which cleared up in twenty-four hours after a few injections of epinephrine and local applications. Could you suggest anything to prevent these attacks, which, because of his trade, he is liable to suffer again, and which will be more difficult to control in view of the fact that he became sensitized to the serum? Please omit name.

M.D., Brooklyn.

ANSWER.—An attempt to desensitize the patient can be made as outlined in THE JOURNAL, June 9, by Leona M. Bayer, in the article on desensitization to insulin allergy. If erysipelas recurs before this can be done, it can in all probability be controlled by ultraviolet treatment or by treatment with roentgen rays. While a few authors complain of inability to control erysipelas with ultraviolet rays, the great majority seem to have been successful and are enthusiastic about the method. Czepa

(Zur Behandlung des Erysipels mit der Quartzlampe, *Wien. klin. Wchnschr.* **35**:564 [June 22] 1922), reports 100 cases mostly on the face. In this location, a prompt cure was obtained in all cases. A few cases on the trunk were refractory. He gave a fairly strong erythema dose on three successive days, the second and third doses somewhat larger than the first, which he described as ten minutes at 80 cm. with a not too old burner. The eyes were protected only by the closure of the lids. The temperature dropped promptly and the disease stopped spreading. The only after-treatment was cool wet dressings of very dilute solution of aluminum acetate or 0.1 per cent resorcin water. The second and third treatments were given as a precaution against relapse.

Josef Becker (Die Wirksame Dosis bei der Quartzlampebehandlung des Erysipels, *München. med. Wchnschr.* **74**:497 [March 25)] 1927) found that one and a half times the erythema dose was efficient. He also repeated this dose as a precautionary measure on the second and third days. For those without a dosimeter, he recommends from nine to twelve minutes at a distance of 100 cm. (40 inches) with a good burner. He warns against too strong a treatment.

As proof that the prompt subsidence of the disease after this treatment is no mere coincidence, he cites a case of erysipelas of the face in which the temperature fell promptly, the general condition improved after the treatment, and the disease ceased to spread except in one spot behind the ear, which had escaped the first treatment. This continued to spread but yielded promptly to direct treatment.

Roentgen treatment of erysipelas is also highly successful. Most of the writers have used about one erythema dose, 300 roentgens, but von Battingen reports that one-fourth erythema dose, 75 roentgens, is successful, repeated on the following day if thought necessary.

G. C. Andrews (Diseases of the Skin, Philadelphia and London, W. B. Saunders Company, 1930, p. 537) reports that fractional doses of x-rays have in two long standing cases of recurrent erysipelas stopped the attacks completely for more than three years.

It would seem, then, that the case under discussion may be successfully treated even though attempts at desensitization fail.

POSSIBLE BENZENE POISONING IN PAINTER

To the Editor:—A painter who had been engaged in doing glazing for five days in confined quarters without ventilation was attacked with a severe dizziness so that he had to quit working. For the past four weeks he has been under my care. His chief complaint is dizziness, which is particularly pronounced on arising from his bed in the morning but occurs also at various periods. He may go around for two or three days without any pronounced dizziness and then have one day in which there is a severe recurrence. In addition to the main complaint of vertigo, which makes it absolutely impossible for him to do his work, he also complains of general weakness and particularly of muscular weakness of the lower limbs. He also complains of occasional spells of dyspepsia and lack of appetite. Physical examination reveals considerable pallor and at times a tendency to jaundice. Occasionally the sclera and the skin are entirely clear, but in most of the visits I find a light yellowish tinge throughout the skin, particularly visible in the sclera. Otherwise the examination is negative. A blood count reveals a secondary anemia with about 3,000,000 red cells, and a white count of about 4,000 cells. The differential revealed about 60 per cent of polymorphonuclears and 40 per cent monocytes. There is no evidence of any basophilia or stippling of red cells. The varnishes used in the glazing contain turpines and benzene. I am impressed that the condition is one of granulocytopenia due to poisoning with benzene. Do you believe that this conjecture is in agreement with the symptoms presented? What would you suggest for the treatment in this case? It is evidently not a case of plumbism. Please omit name. M.D., Ohio.

ANSWER.—In view of the statement that the materials utilized by this worker contain benzene, it seems appropriate to believe that benzene poisoning exists. Especially is this suggested by the anemia and the leukopenia. By way of control and treatment of this condition the following suggestions are made:

1. The worker should be removed from any further exposure to benzene.
2. General measures should be instituted, directed to the prevention of infection and the elimination of the anemia.
3. Exposure to natural or artificial sunlight has proved of value in these milder cases of benzene poisoning.
4. Some good results possibly may arise from the administration of liver extracts. These should be used as in the case of any other form of anemia.
5. Lecithin emulsion (5 cc. of a 10 per cent strength) has been administered intravenously to advantage.
6. Great caution should be exercised in connection with such procedures as dental extraction and tonsillectomy.
7. A high calcium intake in food is commendable.

GLANDULAR DYSTROPHY

To the Editor:—A married woman, aged 27, complains of a menstrual and intermenstrual disorder. The patient is obese, weighing 160 pounds (72.6 Kg.). Her height is 5 feet 2 inches (157.5 cm.). She states that she began her menstrual periods about fifteen years ago. Then the periods were normal, occurring every twenty-seven to twenty-eight days, with a duration of four or five days. Two years later she had scarlet fever. Her periods stopped for four months. Following this amenorrhea she began to have irregular periods, which occurred every two to three months. Ten and one-half years ago she had nine months of amenorrhea, for which she saw a physician. She was given ovarian extract, which started an irregular flow. This type of menstrual flow differs from the previous ones in that it lasts between two weeks and two months, weakening the patient considerably and causing her much left lower quadrant pain. An endocrinologist has tried corpus luteum and anterior and posterior pituitary medication, with inconstant aleviation of symptoms. Theelin was tried, with no relief. One gynecologist told the patient that she had degeneration of both ovaries; another said that she had cysts of both ovaries. Associated with the menorrhagia, the patient has noticed a marked body and facial hirsuties. The latter feature has become so prominent that social contacts are embarrassing. Lately, with oral administration of 5 grains (0.3 Gm.) of whole ovary daily, the patient has not menstruated for one month. Can you offer any suggestions as to further treatment and diagnosis? Do you think the patient will ever be able to conceive? M. I. GOLDIN, M.D., Eloise, Mich.

ANSWER.—The story is that of a woman who is the victim of a pituitary deficiency. This evidently involved first the growth hormone of the anterior lobe and began during her growing years. This is indicated by her short stature. One would speak with more assurance along this line if more of the family history had been given, particularly the height and weight of the parents and siblings. It would also be helpful to know the age of onset of the obesity.

In spite of the absence of that information, the statement can be made with considerable assurance that following the original deficiency of the growth hormone there was later an involvement of the gonadotropic hormones and of some other factor in the pituitary. This further deficiency was probably brought about by the damage wrought by scarlet fever. This disease seems to exert a selective influence on the pituitary, and deficiencies of that organ frequently follow attacks of this disease. A further possibility is that the scarlet fever was accompanied by a temperature sufficient to damage the ovaries directly and that this also was a contributing factor in the amenorrhea that followed the scarlet fever.

The menorrhagia that now troubles the patient is probably due to a lack of the luteinizing factor or hormone of the anterior lobe and probably can be controlled by administering the anterior pituitary-like principle from the urine of pregnancy. This should be given in doses of 1 cc. (from 100 to 125 rat units) or more daily until the bleeding is controlled. Light, so-called stimulating doses of the x-rays applied to the pituitary and ovaries might possibly be helpful, but this treatment entails a certain hazard and should be used only as a last resort. It is unlikely that the oral administration of whole ovary will be of any benefit.

The facial hirsuties is probably due to a pituitary disturbance but raises the question also as to whether it may not be due to an involvement of the suprarenal cortex. It should be recalled that tumors of the cortex occurring in adult women are associated many times with amenorrhea, with hirsuties and with an elevated blood pressure. Other symptoms of this disorder are acne, loss of hair on the head, increased muscular development and a deepening of the voice—a decrease in the female and an increase in the male attributes of the individual. Prolonged treatment of such cases with preparations of the anterior lobe is frequently followed by pregnancy.

SCLERODERMA OR RAYNAUD'S DISEASE

To the Editor:—I am much interested in a high school boy living across the street from me, who is greatly handicapped with Raynaud's disease. His fingers are of stony hardness, flexion and extension are limited, pressure sores appear over the knuckles and on the finger tips, and throughout the winter the hands are blue or purple almost continuously. This summer the fingers are more inflexible than last, although he can drive a car. I would like particularly references to the literature concerning treatment, surgical or medical, possibly a critical review by some one or group of individuals, who have reported a number of their own cases. Also who are some of the neurosurgeons in the Midwest or East who have had a large experience with the disease? M.D., Ohio.

ANSWER.—Obviously the diagnosis in this case is scleroderma involving the extremities: acroscleroderma or sclerodactylia. The onset of this disease is frequently initiated with vasospastic disturbances reflected in color of the skin, such as is seen in Raynaud's disease. Frequently the face and upper part of the thorax are involved in this process. It seems that the primary disturbance involves the smaller arteries and arterioles, with quantitative diminution in the number of vessels and in the circulating blood in the affected parts. The ulcers on the ends of the fingers may contain particles of

calcium from terminal phalanges. This can be shown in the roentgenogram. Arteriography demonstrates an occlusive lesion of the digital arteries and evidence of spastic phenomena. Treatment in the later stages of the disease is not satisfactory. In the earlier types of the disease, in which marked involvement of the joints, deformities and excessive fibrosis of the skin are lacking, cervicothoracic sympathetic ganglionectomy affords the best opportunity for some improvement in the hands and face. If present in the feet, lumbar ganglionectomy is used. The amount of improvement is variable, but in all cases some improvement has been observed. By this procedure the vasomotor control of the vessels of the hands is eliminated, and the maximal flow of blood is permitted to reach these parts. Medical treatment consists of physical therapy and injections of foreign protein to produce systemic fever. This should be continued over a considerable period of time, if well tolerated. In a small percentage of cases, definite progression occurs in spite of all treatment. Death occurs from exhaustion; pathologic changes are found in the heart.

PROVOCATIVE WASSERMANN TEST

To the Editor:—In a syphilitic suspect whose blood Wassermann reaction is negative, what is the value and the technic of a provocative Wassermann test? What interval of time should elapse between the drug given and the taking of the blood specimen? M.D., Tennessee.

ANSWER.—The provocative Wassermann test is of value in diagnosis in patients with a definite syphilitic infection in the past, whether treated or untreated, but with a negative blood Wassermann reaction, in about 10 per cent of the cases in which it is tried. When the blood Wassermann reaction is negative in the presence of a lesion thought to be syphilitic, or if there is persistent partial fixation even in the absence of suggestive lesions, a decision as to whether the patient has syphilis may sometimes be made by observing the effect on the blood Wassermann reaction of a single injection of arsphenamine 0.3 Gm. or of neoarsphenamine 0.6 Gm. The blood Wassermann test should be quantitatively titered at the time of the injection and every other day thereafter for fourteen days. The test is positive if reagin appears in a previously Wassermann negative blood, or if it increases sharply in amount in a blood previously doubtful or positive. The increase of reagin, if it occurs at all, begins about the third day and reaches its maximum about the tenth day with subsequent subsidence to the original level.

Though the provocative Wassermann test is of value as a diagnostic procedure, it is of no value whatever as a criterion of cure. The test is significant only when positive; absence of provocative effect does not signify freedom from syphilis; and in late syphilis, even though previously untreated, the test is much more often negative than positive.

The provocative effect is observed much more frequently in patients with either early or late syphilis in whom the blood Wassermann reaction is already positive at the time of the first arsphenamine injection. It can be demonstrated in the majority of such individuals by means of quantitative titrations of blood serum in the test. The increase in Wassermann titer reaches its maximum between the fifth and tenth days, after which the titer usually subsides promptly to or below its original level.

LESION OF VULVA

To the Editor:—I have a patient who reported to me for examination, May 8. She was three months pregnant and there was a lesion at the fourchette involving the left labium majus. The lesion was about a little more than five-eighths inch vertically and went down into the fourchette, presenting the appearance of a tear. It bled much and is still very vascular. Various local applications were made. It was also cauterized or, rather, phenol (carbolic acid) full strength was applied and did stop bleeding for a while. The patient stated that she discovered the lesion two weeks before I saw it and tried to treat it herself but made it worse. Three Wassermann reactions have been negative and there are no constitutional symptoms that might suggest a syphilitic infection. I am unable to reconcile it with the various lesions usually encountered in that position or place. The part of the labium seems to be healing slowly from its outer border, but deep into the fourchette the condition still obtains and bleeds readily on handling or movement. No constitutional treatment has been given because of lack of indication. There is also a degree of leukorrhea that might contribute to the sluggishness to heal. The patient is sensitive to intercourse, and access to the deep parts is difficult. Kindly advise me in this case. The patient is a Negress, aged 28, a primipara. Please omit name.
M.D., South Carolina.

ANSWER.—In the differential diagnosis of the lesion described, a number of causes must be considered. The lesion may be the result of trauma from coitus or other reason, but such injuries usually heal rapidly unless they become infected. In spite of the negative Wassermann tests and absence of constitutional symptoms, a chancre must be considered. Such a lesion usually has an indurated edge with shallow sloping sides, and the tributary lymph nodes are shotlike. Chancroids are usually multiple, they have soft, undermined edges, they are tender, and they are generally accompanied by buboes in the groin. Diphtheria, while rare, must be considered, but the lesion in most cases is covered by a thick, gray, adherent membrane, and there is fever and usually a history of a similar infection in the throat. The diphtheria bacillus can be isolated readily from such ulcerative lesions. There is a possibility of local tuberculosis, but in most of these cases there is evidence of a similar infection in other organs, the ulcer is slow growing, and its base is shotlike. The lesion may be granuloma inguinale, which occurs almost exclusively in Negroes. In such cases Donovan's bacilli can be isolated and the lesions yield readily to antimony and potassium tartrate and to fuadin. In spite of the patient's age, an early carcinoma must be considered. In such ulcers the border is hard and elevated and the lesion is friable and bleeds easily. In the case cited an effort should be made to detect diphtheria bacilli, Ducrey's bacilli, tubercle bacilli, Donovan's bacilli and spirochetes. Furthermore, a small piece of tissue should be removed and studied microscopically. This will prove or disprove the presence of carcinoma and may reveal the cause of the lesion.

DIAGNOSIS OF FACIAL PARALYSIS

To the Editor:—A man, aged 38, in rugged health, with a completely negative past history of illness or injury, suddenly became dizzy while walking along the street and within a few hours developed a left-sided blindness, a left facial paralysis and a complete left hemiplegia. This was accompanied by headache and a slight ringing sensation in the ears. My examination was made approximately one month after the onset. About five days previous to my examination he had had a partial recovery, but examination showed an involvement of the right optic tract. The reflexes were not disturbed. The blindness was to objects on the left, a homonymous hemianopia. The facial paralysis involved the lower peripheral fibers, but retention of the ability to wrinkle the forehead on both sides was maintained. There was a complete left hemiplegia, presumably an involvement of the right pyramidal tract about the decussation. The tendon reflexes of the arms and legs were both increased and the pathologic reflexes (Babinski, Chaddock) were present. I am presuming that the patient had a thrombus; his blood pressure has been normal throughout; repeated blood Wassermann reactions have been negative, though no spinal test has been made. The question arises as to where the thrombus was or where the lesion occurred, since the right optic tract must be involved back of the supercolliculus, back of the external geniculate body and back of the pulvinar. It is easy to associate this with a lesion of the right pyramidal tract, but it is not so easy for me to understand why the left facial would be involved, on the assumption that the patient has a single lesion. The textbooks are rather confusing as to the amount and degree of supranuclear decussating fibers of the facial. Would it be possible for this man to have sufficient right supranuclear fibers, decussating to the left, to produce such a paralysis? Please omit name.
M.D., Oklahoma.

ANSWER.—The involvement of the face described is of the type that is common in central (pyramidal) lesions and is not due to involvement of the peripheral facial nerve. In a general way it may be said that movements that are essentially bilateral in character, such as those of the upper part of the face and of the large trunk muscles in breathing, are represented in the cortical centers of both sides of the brain, whereas movements that are essentially unilateral are represented mainly only in the motor center of the opposite hemisphere of the brain. This explanation is offered for the clinical observation that a lesion of one pyramidal path affects severely movements that are largely unilateral and affects only slightly those that are mainly bilateral. A lesion in the hinder part of the internal capsule may involve not only the pyramidal fibers for unilateral movements of the opposite side of the body but also the fibers of the optic tract. The sudden onset does suggest a vascular lesion, and the development within a few hours might point to a thrombus. In a man, aged 38, the most common cause for such a vascular insult is syphilitic arteritis. In the absence of evidence of this infection, care should be taken to exclude the presence of a neoplasm in which a vascular lesion has occurred.

PREVENTION OF DISEASE IN TROPICS

To the Editor:—We are planning a cruise to South America, spending three days in British Guiana. My wife and two daughters have never left Wisconsin. Can you advise me the best drug method of malarial prophylaxis, and a simple method of purifying drinking water, other than boiling? Would carbonated beverages be reasonably safe? We are a bit afraid of malaria and typhoid. M.D., Wisconsin.

ANSWER.—Drug prophylaxis is not satisfactory, as in most cases it serves to inhibit clinical manifestations without preventing infection. Although not as extensively tested as the older compounds, atabrine (in curative doses of 0.2 or 0.3 Gm.

daily) promises to be a valuable drug for prophylaxis and is comparatively nontoxic. However, atabrine even in small daily doses of 0.1 Gm. will produce a yellow coloration of the skin after a variable time. This disappears fairly promptly on withdrawal but this may be an objectionable feature to the use of the drug as a prophylactic. For such a short stay the best method of malaria prophylaxis is probably to sleep under a good mosquito net or in screened quarters. It is also advisable to be in screened quarters during the hours immediately preceding and succeeding sunset, as these are the most dangerous hours of anopheline flight. Boiling water is undoubtedly the best method of rendering it safe for drinking. Many of the portable methods of purifying water are too cumbersome for such a short trip and some of them are probably not effective for certain animal parasites. Next to boiling water it is safest to drink such liquids as weak tea. There are also generally available in these parts spring water bottled in the United States, which is safe if one always makes sure that the seal on the bottle is unbroken. In general, carbonated beverages are reasonably safe, but this is due largely to care in manufacturing and to the fairly rapid death of non-spore forming pathogens. Sometimes, however, local products are so unhygienically prepared and so quickly marketed that they are not safe. Beverages that are carbonated by fermentation, such as beer, are safe. For protection against typhoid, vaccination should be considered.

DIABETES, TUBERCULOSIS AND ARTERIOSCLEROSIS

To the Editor:—I have a patient with diabetes and tuberculosis. He was admitted to the hospital in December 1932 with a minimal amount of tuberculosis affecting the right lung, but his diabetic condition, previously undiagnosed, was very severe. Acidosis developed immediately after admission and he came uncomfortably close to death's door. Jan. 12, 1933, he weighed 101 pounds (46 Kg.). At the age of 32 his height is 6 feet 1 inch (185.4 cm.). His condition improved steadily, so that during the summer months he was transferred to the "shack." His weight increased to 152½ pounds (69 Kg.) but at present it averages 136 (62 Kg.), about 10 pounds (4.5 Kg.) more than his best weight previous to admission. The point now is that the condition of his feet is preventing his return to work. Especially during the evening he complains of his feet tiring easily and paining so severely at times that he cannot walk. Both feet show marked sclerosis of the blood vessels, the pulse not being obtained in the dorsalis pedis of the left foot and but poorly in the right. This complaint began soon after the patient began to walk after being confined to bed for some five months. A consultant from Hartford suggested a high carbohydrate diet. This was tried with no avail, and at the request of the patient the former diet was reinstituted, which with some changes is at present protein 95 Gm., fat 192 Gm., carbohydrate 166 Gm., the high calory diet being protein 105 Gm., fat 150 Gm., carbohydrate 220 Gm. Immersions in hot and cold water, and cod liver oil rubs have been tried without success. Have you any suggestions to offer? I realize that the foregoing is rather short in a desire to avoid too many details. I neglected to say that the insulin dosage is breakfast 13 units, dinner 5 units and supper 8 units.

VIRGIL F. NEUMANN, M.D., Norwich, Conn.

ANSWER.—Neuritis on an arteriosclerotic basis would appear to be the cause of the pains in the feet. The marked arteriosclerosis in a 32 year old patient with diabetes of not more than two years' duration is striking and perhaps might be related to the gain of 50 per cent of body weight in a short period. One would like to know the fasting cholesterol value.

Is the patient taking alcohol?

The prognosis of diabetic neuritis is almost invariably favorable, although usually requiring months rather than weeks and sometimes even a year for recovery.

The avoidance of extremes in diet, thus, carbohydrate not over 175 Gm., protein 100 Gm. and fat from 100 to 130 Gm. according to retention of body weight, would seem indicated along with insulin sufficient to control the diabetes. Green vegetables, tomato juice, a dessertspoonful of cod liver oil and avoidance of any extremes in local treatment are the indications together with the guaranty that eventually recovery will follow.

USE OF CALCIUM INTRAVENOUSLY—CALCIUM IN TUBERCULOSIS

To the Editor:—My local drug supply house informed me that various preparations of calcium intended for intravenous injections have recently been withdrawn from the market. They presume that this has been due to instability of precipitation. I will be much obliged to you for the latest information as to the status of intravenous calcium therapy, especially for tuberculosis. Would it be better for me to prepare fresh solutions of calcium in my own laboratory immediately before the injections, and if so, what preparation should I use and how should it be made up and given? G. P. LAWRENCE, M.D., Westerville, Ohio.

ANSWER.—We are not aware of solutions containing calcium intended for intravenous injections having been recently withdrawn from the market. Some time ago it was found that calcium gluconate solutions would precipitate, particularly in the cold, but by warming would be redissolved. To overcome this difficulty one firm is marketing its solution in admixture with calcium lactobionate. The Council has not reported on the use of calcium in the treatment of tuberculosis. In general, the evidence has not borne out the early enthusiasm for such therapy, although it may have a limited field of usefulness. Mayer and Wells concluded that there is no acceptable clinical evidence for the value of calcium therapy in tuberculosis. Their animal experiments failed to show that calcium therapy favorably affected the course of the disease. Calcium compounds have been used in tuberculosis to remedy calcium deficiency, to lessen inflammatory exudate, to favor calcification of lesions and to lessen sweating and diarrhea; but it is not considered an essential remedy by critical students of the subject.

PURPURA SIMPLEX

To the Editor:—A woman, aged 28, unmarried, complains of a reddened pin point to pin head sized lesion beneath the skin above her ankles, which appears every summer. Heat from a motor car will also produce these lesions. She is a blonde. The Wassermann reaction, urinalysis and blood counts are normal. The tourniquet test is positive, although the spleen is not palpable. Can you suggest any way of preventing these lesions? Kindly omit name and address. M.D., California.

ANSWER.—There are a number of points concerning the description of these lesions that would be of interest. The question as to whether they are macular and fade on pressure or definitely purpuric cannot be settled from the description. In either case they fall into the erythema group. In this group one may have different clinical pictures, depending on the amount of vascular permeability. It is the latter factor that determines the morphology of the lesion. From the data submitted the patient appears to have a condition known as purpura simplex. Individuals with this condition are otherwise in good health, show no spontaneous mucous membrane bleeding and have purpuric lesions only on the most dependent portions of the body. The direct causative factor is an abnormal vascular permeability, which is brought to light spontaneously by such factors as are given in the history, or it may be induced by the tourniquet test. The coagulation, bleeding and cloth retraction times are normal in such cases. Given this constitutional background, a number of precipitating factors may produce this symptom, among which are endocrine disturbances, particularly during the menstrual cycle, infection and external irritants. In the absence of such factors the following regimen may be of benefit: The diet should contain adequate amounts of foods that contain vitamin C. Factors producing stasis in the dependent parts of the body should be removed and measures designed to improve circulation should be instituted. Contrast baths are often combined with the use of mild astringent lotions, and in some cases definite benefit may be observed. Calcium preparations are often prescribed, but the value of such therapy is questionable. Cases of this type have a favorable prognosis.

POSSIBLE BENZENE POISONING WITH GRANULOCYTOPENIA

To the Editor:—Can you tell me whether the solvents for Plastic Wood and Valspar contain benzene or any of the allied substances? A patient who had had several attacks of granulocytopenia, definitely known to be due to amidopyrine, had refrained from all such drugs with good results, i. e., had had a normal white cell count for some months. After he had been exposed to the fumes of these two substances in a closed room, the white cell count fell to 2,075, with 27 per cent neutrophils. No other cause could be found and there have been no further attacks for about a year. I thought that perhaps the bone marrow had become very sensitive to these agents. Please omit name. M.D., Virginia.

ANSWER.—The present reply refers to no specific product but instead to the general classes of substances into which fall the two items mentioned in the query.

Varnishes prior to thinning consist of various gums cooked up with oils, such as China wood or linseed. Ordinarily varnishes are thinned with petroleum naphtha and turpentine. However, they may be thinned with solvent naphtha, which may contain approximately 50 per cent of benzene. Since spar varnishes represent a high type of varnishes and since solvent naphtha instead of petroleum naphtha is more likely to be used in high type varnishes, exposure to benzene probably takes place frequently. This is true for the manufacture of varnishes as well as for their application. Plastic fillers, of which plastic wood is one variety, may be made from a variety of substances, such as saw dust, cheese and synthetic resins. These solid materials are mixed with some quick drying substance, such as varnishes, naphthas and various alcohols, including methanol. Here again opportunity may arise for exposure to benzene or benzene-like substances. The assumption implied in the query that benzene poisoning exists or has existed is within reason.

IMPOTENCE AFTER INJECTION FOR INGUINAL HERNIA

To the Editor:—I have a patient, aged 58, with impotence. The blood pressure is normal and the Kahn reaction negative. Two and a half years ago he had a fracture of the seventh cervical vertebra and also some injury to the base of the spine but no fracture. In April 1933 he had an operation for double hernia following some injection treatment, which produced a great deal of scar but no cure of the hernias. The surgeon said that the scar was very dense. The roentgenogram taken about one year after the accident shows some scar in the region of the coccyx. His wife died following this accident and he remarried last December. He was potent for about one month, when he noticed that his testicles were getting smaller. On examination I found the right testicle to be about the size of an ordinary peanut and the left about twice that size. He shows no other symptoms along the urinary tract or otherwise except that he tires more easily than ordinarily. I would be pleased if you could give me the cause of testicular atrophy in such a case. The man is very well preserved physically and is alert mentally. Please omit name.

M.D., Michigan.

ANSWER.—In the absence of any pressure symptoms on the cord, such as paralysis or bladder symptoms, the spinal injuries can be excluded as a cause of either the impotence or the atrophy of the testicles. It is likely, however, that the injections he received for his hernias cut off or greatly interfered with the blood supply of the testicles. This result is at times seen in poorly done varicocele operations as well as in other operations on the spermatic cord in which the arteries which supply the testicles and which accompany the cord are tied off. It may therefore be possible that the small testicles do not produce enough hormone and that impotence will result.

PARALYSIS AGITANS

To the Editor:—My wife fell about two years ago, injuring her spine in the lumbar region. This does not give her any pain or trouble, but she has developed paralysis agitans. I have consulted several colleagues. I am giving her a general tonic and scopolamine hydrobromide 1/150 grain (0.4 mg.) once or twice a day, which seems to hold the condition in check. I have been thinking of light massage to the right arm and hand, which are affected; perhaps a light treatment of high frequency (violet ray) might be beneficial. Would you kindly let me know? If you have any other suggestions, I would appreciate them. She is 66 years of age. Is it beneficial to exercise the arm and hand or best to spare using them? Please omit name.

M.D., New York.

ANSWER.—Therapeutic measures in paralysis agitans that give the most relief are of a sedative nature, such, for example, as scopolamine and related drugs. In the general management in such cases stimulants and excitants, mental as well as physical, should be avoided, as they tend to aggravate the symptoms. The aim should be the provision of a quiet and monotonous routine, which is at the same time as satisfying and interesting to the individual patient as can be devised. Fatigue is harmful, and exercise and activity should be limited to avoid it. Stimulating massage of the muscles and undue exercise tend to aggravate the symptoms; light skin friction or vibratory massage will often give relief, though sometimes, owing to idiosyncrasies, they may distress the patient and should be avoided. Infra-red rays in doses that will not cause reactions in the skin and autocondensation may also be helpful. Such measures are of course palliative and not curative, but they may help to occupy the time of the patient and afford non-stimulating variety.

HERPES PROGENITALIS

To the Editor:—A man, aged about 50, had an attack of influenza several months ago from which he made a good recovery. But, accompanying the attack, a small group of vesicles formed under the glans penis near the frenum, typical of herpes progenitalis, which was rather severe and stubborn but finally responded to the usual treatment. Later a reddish macule about 2 by 3 cm. appeared on the upper surface of the glans, extending to the meatus and having some small, slightly elevated papules scattered throughout. It has disappeared once, or appeared to do so, to return again. There are practically no symptoms (itching or pain). I have advised alcohol locally—saturated solution of alum and Whitfield's ointment (mild), thinking it might be some form of tinea infection, which he has had ingrown at times. His health is good otherwise. What do you suggest as cause and treatment? Please omit name.

M.D., Arkansas.

ANSWER.—It is somewhat difficult to answer the query correctly from the description given. One would be inclined to think that the patient is having recurrent attacks of herpes progenitalis. Occasionally the lesions do not show themselves in a characteristic vesicle form; they may show up simply as a reddish macule or as a slightly elevated papule, such as the writer describes. The fact that they have disappeared and come back again would incline one more than ever to such a diagnosis. Why these began following the attack of influenza, it is impossible to state. It may have been simply coincidence. In some cases herpes progenitalis appears as the result of irritation; for example, the use of rubber condoms. The use of hot potassium permanganate soaks might be tried for these attacks, and in case there is a long foreskin, it might be well to have a circumcision.

TREATMENT OF ANKYLOSED JOINTS

To the Editor:—What benefit can I expect a patient to derive from a course of diathermy treatments for ankylosed joints, resulting from acute multiple arthritis following an infected gunshot wound? A woman, aged 22, received the wound, May 12, 1933. She developed acute multiple arthritis, Oct. 9, 1933, and was in bed four and one-half months. She was in a plaster cast eighteen days, and the result was an ankylosed hip joint, ankle and elbow joint. The elbow was aspirated during the acute stage of inflammation and held firmly in splints for two months. Will diathermy applied to these stiffened joints now absorb the calcium deposits and give the patient normal motion in them? Roentgenograms show considerable calcium deposit but no destruction or erosion of the bony tissue. Please omit name and address.

M.D., Missouri.

ANSWER.—In the treatment of ankylosed joints, medical diathermy through the joints will not absorb the calcium deposits or increase the motion. There are two types of ankylosis, bony and fibrous, and it is not possible from the facts given to determine exactly the type of this case. The treatment of a bony or true ankylosis is surgical, and physical agents will not give results.

In fibrous ankylosis the principles of treatment are to increase the local circulation by luminous heat, hot whirlpool baths or medical diathermy. This is followed by stroking and kneading massage for the same purpose. When the process has quieted down and the pain has disappeared, stretching should be tried at intervals or with continuous traction. Great care should be taken to avoid reaction. If there is a reaction and continued pain, operation should be considered.

REMOVAL OF MOLE FROM CHEEK

To the Editor:—Please state the best way to remove a small flat mole from the cheek of a middle aged man. He wishes the procedure to cause as little scarring as possible. The mole is nonpigmented and there is no history of cancer in the family. There is only one mole in the middle of his left cheek and he thinks that it mars his good looks; besides, he sometimes cuts it in shaving. I have been asked to remove it for him. Kindly give me your answer. It extends slightly above the surrounding skin. He says it has recently grown larger. It is slightly redder than his reddish complexion. What does electricity offer? The mole is of about thirty years' duration. Kindly omit name.

M.D., West Virginia.

ANSWER.—There is no way in which the mole described can be removed without leaving some permanent defect. From a purely cosmetic standpoint the best results are obtained with skilfully applied electrolysis. Scalpel excision will eradicate the mole completely and there may be nothing but an inconspicuous linear scar. Electrodesiccation is likely to leave a disfiguring scar. Everything considered, probably the best method of procedure in this case is scalpel excision.

GONORRHEAL CERVICITIS

To the Editor:—A woman, aged 22, has had gonorrheal cervicitis for the past year and a half, starting with an acute gonorrheal vaginitis and cervicitis. The vaginitis responded nicely to local treatment. The cervix has been treated with frequent intracervical applications of silver nitrate in strengths up to 20 per cent and with intracervical application of the cautery. In addition, tampons and douches have been used. She has also had a course of gonococcus vaccine. In spite of all this, she still has a copious discharge from the cervix, which, however, has for a long time been negative for gonococci. Can you advise me as to the best methods for clearing up this discharge? The tubes and uterus are normal. Kindly omit name and address.

M.D., New York.

ANSWER.—Medical diathermy and the Elliott treatment are both entitled to consideration in the management of stubborn cases of this character. Their value is problematic.

A badly diseased endocervix should be given a long period of rest after each cautery treatment. Anxiety to obtain a favorable result has perhaps led to overtreatment. If two or three thorough endocervical cauterizations, at intervals of several months, do not yield the desired result, recourse to amputation of the cervix should be considered. A modified Schroeder operation is well adapted to these cases.

SOMNAMBULISM

To the Editor:—I should like to have some information on the treatment of somnambulism.

W. W. BOLTON, M.D., Lansdowne, Pa.

ANSWER.—Somnambulism is usually not an actual walking in a state of sleep, because somnambulists commonly avoid obstacles, pick up objects and talk. The condition is allied to hysteria and a portion of the personality is split off or sub-

merged. A similar process may happen in normal persons in moments of intense concentration. As it is a disorder of the personality, treatment should begin with a thorough study of that personality with proper search for conflicts, fears, doubts, strains, false beliefs and the like. Satisfactory results may follow, depending on the data uncovered and the adjustment of the patient to new points of view and his cooperation in new habit formations. Each case is an individual life problem in itself and more specific directions cannot easily be given. Secondarily, of course, various mechanical means may be devised to confine the patient to bed or to produce some stimulus strong enough to "awaken" him if he gets out of bed. Avoidance of unusual fatigue or excitement is helpful and, in the case of a child, fairly constant guarding may be necessary.

INTERMITTENT NEGATIVE PRESSURE IN ENDARTERITIS

To the Editor:—Will you please send me information regarding a new treatment of which I have heard for obliterative endarteritis? The treatment requires an air tight chamber in which the foot and leg are placed. A motor driven pump is attached to the chamber and the pressure in the chamber is alternately diminished and increased to stimulate circulation. Where are the treatments given and who makes the apparatus?

H. ST. JOHN WILLIAMS, M.D., Poughkeepsie, N. Y.

ANSWER.—The intermittent negative pressure apparatus for increasing the circulation to the extremities in cases of occlusive arterial disease was developed independently by Louis G. Herrmann and E. M. Landis of the Colleges of Medicine of the Universities of Cincinnati and Pennsylvania, respectively. There are a number of articles in the medical literature by these investigators, representative of which are:

Herrmann, L. G., and Reid, M. R.: The Pavaex (Passive Vascular Exercise) Treatment of Obliterative Arterial Diseases of the Extremities, *J. Med.* **14**: 524 (Dec.) 1933.

Landis, E. M., and Gibbon, J. H., Jr.: The Effects of Alternate Suction and Pressure on Blood Flow to the Lower Extremities, *J. Clin. Investigation* **12**: 925 (Sept.) 1933.

Distribution of the apparatus is under the control of the investigators mentioned.

LUPUS ERYTHEMATOSUS

To the Editor:—In the treatment of lupus erythematosus what bismuth preparation, given intramuscularly, is used? Please give dosage and frequency. Kindly omit name.

M.D., New York.

ANSWER.—Lupus erythematosus can be treated in the same way, with the same dosage and the same preparation of bismuth that is used for the treatment of syphilis. As in the treatment of syphilis, care must be exercised to avoid overtreatment for, unless the human organism can respond to the stimulation of the drug, harm will be done instead of good.

A dosage of 1 or 2 cc. of a 10 per cent suspension of bismuth subsalicylate in a vegetable oil can be given in gluteal muscles once a week. Other bismuth preparations are valuable, differing in dosage and frequency of administration. The urine should be examined for albumin and casts before each treatment and the patient quizzed regarding any itchy eruption. A bismuth line at the margin of the gums is not a contraindication to further treatment pursued with proper caution.

The results from bismuth therapy of lupus erythematosus are less certain than those obtained by the use of gold compounds, but success is sometimes achieved with bismuth therapy after gold has failed.

HYPERKERATOSIS SUBUNGUALIS

To the Editor:—I have a case in which there is an overgrowth of the nail of the great toe. The overgrowth has been removed two different times and recurs after several months. This is probably a case of onychauxis or hyperkeratosis subungualis. Could you tell me how to cure this condition, or will it be necessary to remove the distal phalanx of this toe? Please omit name.

M.D., Illinois.

ANSWER.—The removal of the nail alone will not cure the condition, because the growing matrix or root will promptly form a new nail.

The proper surgical treatment is to remove the matrix as well as the nail. The matrix may be identified as the dense gray tissue lying beneath the proximal portion of the nail. It extends close to the bone and well back to the base of the distal phalanx. The entire matrix must be cut away or it will reform a deformed nail. The skin at the sides of the base of the nail may be incised and the skin flap turned back so as to expose the matrix. After removal of this tissue the flaps may be replaced and left without suture.

Healing will occur usually without complications.

QUINCKE'S DISEASE

To the Editor:—A man, aged 30, always well, was afflicted with Quincke's disease about two years ago. Since then he has had manifestations of this sickness in various parts of his body, almost continuously. He has received the usual medication but with little relief. Are there any new remedies for this disease? How about glandular therapy? Please omit name.

M.D., Massachusetts.

ANSWER.—The name Quincke's disease has been applied to two different conditions: angioneurotic edema and meningitis serosa. From the description given it is presumed that the former is meant. Angioneurotic edema is usually considered to be an expression of allergic reaction and for this reason atropine and epinephrine are often administered and may give relief. It is certainly advisable to have the patient tested for sensitivity to foreign proteins of various kinds and to search for foci of infection that might serve as a source of sensitivity to bacteria. It has also been thought that in some instances this skin disease is of psychogenic origin; if no sensitivity is discovered, it would be well to consult a psychiatrist.

VULVAR INFLAMMATION

To the Editor:—A young woman has a varying number of small lesions just outside the hymen, usually macular, sometimes papular, which are extremely tender to touch. These lesions come and go without treatment and apparently have no relation to menstruation. Can you suggest diagnosis and treatment? Please omit name.

M.D., Missouri.

ANSWER.—The most common vulvar eruption is an inflammation of the hair follicles. This may be produced by leukorrhea so slight in amount as scarcely to be noticed. The irritation of clothing, perspiration and chafing are other less common causes.

The hair may be clipped if unduly long, but it should not be shaved. Cleansing douches or nightly vaginal instillation of 2 or 3 cc. of 3 per cent tannic acid in glycerin suffice to control the lesions caused by leukorrhea.

PARANAVEL COLIC IN CHILDREN

To the Editor:—What is meant by paranavel colic (pain about the navel region of colicky character, frequent in children)? I find nothing in the literature about it. Please omit name.

M.D., New York.

ANSWER.—Before a diagnosis of paranavel colic is made, a number of conditions of more or less importance should be excluded. Appendicitis or its adhesions must be considered. Recurrent attacks of abdominal pain in the region of the navel are probably due to a downward pull on the ligamentum teres, which lies between the umbilicus and the liver. The condition is encountered most frequently in the active, overweight child with a pendulous abdomen.

Morse's article "Recurrent Abdominal Pain in Childhood" in the June issue of the *Journal of Pediatrics* mentions Pott's disease, pelvic disease, lead poisoning, epigastric hernia, intestinal worms, abdominal adenitis, tuberculous peritonitis, spasm of the intestine, redundant colon, constipation and indigestion.

EYE CONDITIONS OF WORKERS IN HAIR INDUSTRY

To the Editor:—I would greatly appreciate any information you can give me on eye conditions peculiar to workers in the hair industries, especially in regard to any type of keratitis. Is keratitis punctata superficialis ever due to or influenced by working in hair (animal)? Please omit name.

M.D., Chicago.

ANSWER.—The presence of loose hairs of almost any sort in the conjunctival sac can lead easily to a form of keratitis that may resemble a keratitis punctata superficialis. It is believed that the corneal trouble is of a traumatic nature, as the loose and somewhat stiffened ends of the hairs rub against the corneal epithelium, producing almost microscopic abrasions. These erosions become lightly infiltrated and the clinical picture of a superficial punctate keratitis results. This coincides with the condition that is known to be due to caterpillar hairs in the conjunctival sac. A true keratitis punctata superficialis is believed to be due to an infection (Wright) and not to trauma.

TOXICITY OF PANCREATIN

To the Editor:—The dose of pancreas desiccated or pancreatin as given in the textbooks is from 2 to 5 grains. I would like to know whether it is toxic when given in large quantities and if toxic how it is manifested clinically.

SAMUEL GORSKY, M.D., Philadelphia.

ANSWER.—Pancreatin administered by mouth is not toxic. It can be given in much larger than the official doses; e. g., in quantities of 4 Gm. or more.

Council on Medical Education and Hospitals

COMING EXAMINATIONS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written (Group B candidates).* The examination will be held in various cities throughout the country, April 29. *Oral (Group A and Group B candidates).* New York, June 10. Sec., Dr. C. Guy Lane, 416 Marlborough St., Boston.

AMERICAN BOARD OF OPHTHALMOLOGY: Philadelphia, June 10. Sec., Dr. William H. Wilder, 122 S. Michigan Blvd., Chicago.

ARIZONA: *Basic Science.* Tucson, Dec. 18. Sec., Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson. *Medical.* Phoenix, Jan. 2-3. Sec., Dr. J. H. Patterson, 320 Security Bldg., Phoenix.

CALIFORNIA: *Reciprocity.* Los Angeles, Dec. 5. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

CONNECTICUT: *Endorsement.* Hartford, Nov. 27. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden.

DELAWARE: Wilmington, Dec. 11-13. Sec., Dr. Harold L. Springer, 1013 Washington St., Wilmington.

DISTRICT OF COLUMBIA: *Basic Science.* Washington, Dec. 27-28. *Medical.* Washington, Jan. 14-15. Sec., Commission on Licensure, Dr. W. C. Fowler, 203 District Bldg., Washington.

KANSAS: Topeka, Dec. 11-12. Sec., Dr. C. H. Ewing, Larned.

KENTUCKY: Louisville, Dec. 4-6. Sec., State Board of Health, Dr. A. T. McCormack, 532 W. Main St., Louisville.

MARYLAND: *Regular.* Baltimore, Dec. 11-14. Sec., Dr. Henry M. Fitzhugh, 1211 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 11-12. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MINNESOTA: *Basic Science.* Minneapolis, Jan. 2-3. Sec., Dr. J. Charnley McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Medical.* Minneapolis, Jan. 15-17. Sec., Dr. E. J. Engberg, 350 St. Peter St., St. Paul.

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II.* The examinations will be held in medical centers where there are five or more candidates, Feb. 13-15. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

NEBRASKA: Lincoln, Nov. 22-23. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NORTH CAROLINA: *Endorsement.* Raleigh, Dec. 3. Sec., Dr. Benj. J. Lawrence, 503 Professional Bldg., Raleigh.

NORTH DAKOTA: Grand Forks, Jan. 1-4. Sec., Dr. G. M. Williamson, 4½ S. 3d St., Grand Forks.

OHIO: Columbus, Dec. 3-6. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: *Reciprocity.* Oklahoma City, Dec. 11. Sec., Dr. J. M. Byrum, Mammoth Bldg., Shawnee.

OREGON: Portland, Jan. 2-4. Sec., Dr. Joseph F. Wood, 509 Selling Bldg., Portland.

TEXAS: Galveston, Nov. 20-22. Sec., Dr. T. J. Crowe, 918 Mercantile Bank Bldg., Dallas.

VIRGINIA: Richmond, Dec. 12-14. Sec., Dr. J. W. Preston, 803 Medical Arts Bldg., Roanoke.

WISCONSIN: *Basic Science.* Milwaukee, Dec. 15. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

National Board of Medical Examiners

The National Board of Medical Examiners reports that its certificate was awarded to 355 candidates who passed the final examination held during June and July, 1934. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
College of Medical Evangelists	(1932), (1933, 3), (1934, 35)		39
Stanford University School of Medicine	(1932), (1934, 2)		3
University of Southern California School of Medicine	(1934, 2)		2
University of Colorado School of Medicine	(1932, 4), (1933)		5
Yale Univ. School of Med.	(1927), (1930), (1932, 8), (1933, 7)		17
George Washington Univ. School of Med.	(1932, 2), (1933)		3
Georgetown University School of Medicine	(1933)		1
Howard University College of Medicine	(1930), (1933)		2
Emory University School of Medicine	(1933)		1
University of Georgia School of Medicine	(1928)		1
Loyola University School of Medicine	(1934, 2)		2
Northwestern Univ. Med. School	(1932), (1933, 3), (1934, 13)		17
Rush Medical College	(1928), (1933, 3), (1934, 10)		14
School of Medicine of the Division of the Biological Sciences	(1933)		1
State University of Iowa College of Medicine	(1931), (1933, 3)		4
University of Kansas School of Medicine	(1933)		1
University of Louisville School of Medicine	(1933)		1
Tulane University of Louisville School of Medicine	(1931, 3), (1932, 3), (1933, 4)		10
Johns Hopkins University School of Medicine	(1931, 3), (1932, 2), (1933, 4)		9
University of Maryland School of Medicine and College of Physicians and Surgeons	(1933, 3)		3
Boston Univ. School of Med.	(1931, 2), (1932, 2), (1933, 8)		12
Harvard University Medical School	(1928), (1929), (1931, 10), (1932, 28), (1933, 6)		46
Tufts Col. Med. Sch.	(1930), (1931, 2), (1932, 6), (1933, 6)		15
Univ. of Michigan Med. School	(1931), (1932, 5), (1933, 6)		12
University of Minnesota Medical School	(1933), (1934, 8)		9
St. Louis University School of Medicine	(1933, 3)		3
Washington University School of Medicine	(1929), (1933, 2)		3
Albany Medical College	(1933, 11)		11
Columbia University College of Physicians and Surgeons	(1931), (1932, 7), (1933, 4)		12
Cornell Univ. Med. Col.	(1923), (1931), (1932, 2), (1933, 6)		10
New York Homeopathic Med. College and Flower Hosp.	(1932)		1
New York University, University and Bellevue Hospital Medical College	(1933, 5)		5
Syracuse University College of Medicine	(1932, 2), (1933, 3)		5
University of Buffalo School of Medicine	(1933, 3)		3
Univ. of Rochester School of Med.	(1931, 2), (1932), (1933, 3)		6
Duke University School of Medicine	(1932, 2), (1933, 2)		4
Ohio State University College of Medicine	(1933, 2)		2
University of Cincinnati College of Medicine	(1934)		1
University of Oklahoma School of Medicine	(1932)		1
University of Oregon Medical School	(1933, 4)		4
Jefferson Medical College of Philadelphia	(1932, 2), (1933)		3
Univ. of Pennsylvania School of Medicine	(1932, 8), (1933, 7)		15
University of Pittsburgh School of Medicine	(1932)		1
Woman's Med. College of Penna.	(1931), (1932, 4), (1933, 4)		9
Vanderbilt University School of Medicine	(1932)		1
Univ. of Vermont College of Med.	(1931), (1932, 3), (1933, 7)		11
Medical College of Virginia	(1933)		1
University of Virginia Department of Medicine	(1932)		1
Marquette University School of Medicine	(1934, 2)		2
University of Manitoba Faculty of Medicine	(1931)		1
McGill Univ. Faculty of Medicine	(1931), (1932), (1933, 2)		4
University of Edinburgh Faculty of Medicine	(1932), (1933)		2
Universität Bern Medizinische Fakultät	(1930)		1
American University of Beirut School of Medicine	(1933, 2)*		2

* Verification of graduation in process.

Wisconsin June Examination

Dr. Robert E. Flynn, secretary, Wisconsin State Board of Medical Examiners, reports the written and practical examination held in Milwaukee, June 26-29, 1934. The examination covered 19 subjects and included 100 questions. An average of 75 per cent was required to pass. One hundred and five candidates were examined, 101 of whom passed and 4 failed. Twelve applicants were licensed by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists	(1934)		86
Loyola University School of Medicine	(1934)		81
Northwestern University Medical School	(1933) 85, 85, 86, (1934) 80, 83, 85, 85, 85, 86		85,
Rush Medical College	(1928) (1934) 84, 85, 86, 90		79,
University of Illinois College of Medicine	(1933)		85
State University of Iowa College of Medicine	(1933)		83
Harvard University Medical School	(1932) 84, (1933)		86
Tufts College Medical School	(1933)		84
University of Michigan Medical School	(1930)		83
University of Minnesota Medical School	(1933)		82
Washington University School of Medicine	(1932)		89
Ohio State University College of Medicine	(1933)		77
University of Oregon Medical School	(1932)		84
University of Pennsylvania School of Medicine	(1933)		85
Woman's Medical College of Pennsylvania	(1929)		77
Marquette University School of Medicine	(1934) 77, 78, 78, 79, 79, 80, 80, 80, 80, 81, 81, 81, 81, 82, 82, 82, 82, 82, 83, 83, 83, 83, 83, 83, 84, 84, 84, 84, 84, 84, 84, 84, 85, 85, 86, 86, 86, 87, 88		77,
University of Wisconsin Medical School	(1931) (1932) 78, 84, 86, 86, (1933) 79, 81, 82, 82, 82, 83, 83, 84, 84, 85, 85, 85, 85, 85, 85, 85, 86, 86, 86, 87, 88, 89, 89, *		83,
Osteopaths †			80, 83

School	FAILED	Year Grad.	Per Cent
University of Minnesota Medical School	(1934)		71
University of Nebraska College of Medicine	(1933)		73
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin	(1932)‡		73
Julius-Maximilians-Universität Medizinische Fakultät, Würzburg	(1925)		71

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Rush Medical College	(1932), (1933)		Illinois
University of Illinois College of Medicine	(1932)		Illinois
State University of Iowa College of Medicine	(1928)		Iowa
University of Kansas School of Medicine	(1927)		Kansas
Western Reserve University School of Medicine	(1932)		Ohio
University of Wisconsin Medical School	(1930) (1931) New Jersey, (1932) California		Oklahoma,
Osteopaths †		Iowa, 2,	Missouri

* No average grade reported.
† Licensed to practice osteopathy and surgery.
‡ Verification of graduation in process.

Wisconsin September Reciprocity Report

Dr. Robert E. Flynn, secretary, Wisconsin State Board of Medical Examiners, reports 4 physicians licensed by reciprocity at the meeting held in Green Bay, Sept. 11, 1934. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Loyola University School of Medicine	(1932)		Illinois
Rush Medical College	(1899)		S. Dakota
John A. Creighton Medical College	(1908)		Nebraska
Vanderbilt University School of Medicine	(1929)		Tennessee

Book Notices

A Text-Book of Pathology: An Introduction to Medicine. By William Boyd, M.D., M.R.C.P., F.R.C.P., Professor of Pathology in the University of Manitoba. Second edition. Cloth. Price, $10. Pp. 1047, with 424 illustrations. Philadelphia: Lea & Febiger, 1934.

The appearance of the second edition of a textbook of pathology two years after its first publication is good evidence that it has been received with favor. Much new material has been introduced, notably paragraphs about glycogen storage (von Gierke's disease), on rhinosporidiosis, on medionecrosis of the aorta, on renal architecture in chronic Bright's disease (Oliver's work), on arrhenoblastoma, and on recent observations on encephalitis. In the part on general pathology, certain changes have been made in the order of the chapters so as to secure a more logical sequence. The part on immunity and allergy "has been entirely rewritten" and perhaps this is the part of the book that is in the greatest need of still further revision in the interest of greater clarity, simplification and better emphasis on the essentials as well as avoidance of contradictions. The section on epidemics is superficial and fails to take into consideration that epidemic diseases differ fundamentally in their ways of spreading. To say that "in epidemiology as in metaphysics there is more guesswork than solid ground" is an unhappy and unwise "wise crack." On page 168 one reads of guinea-pigs being injected with horse serum "in an amount even as small as 1 to 1,000 cc.," but otherwise the proofreading seems to have been done with great care. But what can this statement on page 159 mean? "An injection of so minute a dose as 0.1 cc. of immune serum will protect a monkey against yellow fever, and the same is true of measles and dog distemper." The second part, on special pathology, seems to answer the purpose of introducing the student to the study of medicine exceptionally well. In future editions, the efforts to avoid unnecessary repetitions in the second part of statements in the first part and vice versa should be continued. A new chapter dealing with some of the principal diseases of the teeth has been added.

Die Haut- und Geschlechtskrankheiten: Eine zusammenfassende Darstellung für die Praxis. Herausgegeben von Prof. Dr. Leopold Arzt und Prof. Dr. Karl Zieler. Lieferung 15, Band V. Die Behandlung des Trippers beim Manne. Von Prof. Dr. Georg Birnbaum. Instrumentelle Behandlung des Trippers beim Manne. Von Dr. Alois Glingar. Die Heilung des Trippers und deren Feststellung beim Manne. Von Prof. Dr. Karl Zieler. Der Tripper des Weibes. Von Prof. Dr. Konstantin J. Bucura. Paper. Price, 8 marks. Pp. 177-346, with 51 illustrations. Berlin & Vienna: Urban & Schwarzenberg, 1934.

This number is divided into four parts, each contributed by an authority on his subject. Professor Birnbaum's article on the treatment of gonorrhea in the male is inclusive and expresses the most modern concept of conservative therapy. Dr. Glingar contributes a thoroughly complete exposition of the instrumental treatment of gonorrheal infection in the male. The article by Dr. Zieler on the cure and determination of cure in the male is excellent. He elaborates on the methods of determining whether a patient has been cured and states that results are from 98 to 99 per cent accurate by modern provocative tests and careful and repeated subsequent examinations. A masterly discussion of gonorrheal infection in the female is the contribution of Professor Bucura of Vienna. This article is brilliantly illustrated with excellent anatomic drawings and histologic preparations.

Your Meals and Your Money. By Gove Hambidge. Cloth. Price, $1.50. Pp. 190, with illustrations. New York & London: Whittlesey House, McGraw-Hill Book Company, Inc., 1934.

Gove Hambidge turns from the stimulating philosophy of his previous book, Time to Live, to the hard facts in a way that demands attention. He warns scientific readers that his presentation will sometimes make the scientist's hair stand on end, but he makes no apology for so doing because he wants people to read the book—and it would seem that they certainly ought to. The book is an effort to translate adequate diet into dollars and cents. The author divides families into four groups: those who earn $3,000 a year or more, those who earn from $1,800 to $3,000, those who earn from $1,000 to $1,800 and those who earn less than $1,000. For each income group he has a plan according to which the housewife may know exactly how much she should spend for food to make sure that the diet contains adequate amounts of essential food material and that money is not wasted on dietary nonessentials. The book is full of tables, graphs and charts. It would repay careful study on the part of every mother who is faced with the serious problem of feeding the family on a limited budget; for the woman who does not need to count her pennies, it would be just as beneficial in teaching her to get the most food for her food dollar. It should help many a physician to answer the questions of his patients who, when he has perscribed a diet, counter with the despairing query "But doctor how can I afford it?"

Clinical, Pathogenetic and Experimental Investigations of Endometriosis, Especially Regarding the Localisation in the Abdominal Wall (Laparotomy Scars) with a Contribution to the Study of Experimental Transplantation of Endometrium. By Hans Fredrick Harbitz. Acta chirurgica Scandinavica, Vol. LXXIV. Supplementum XXX. Paper. Pp. 400, with 70 illustrations. Oslo: Kristes Boktrykkerl, 1934.

The author, who is the son of Prof. Francis Harbitz, director of the Institute of Pathology in Oslo, derived his incentive for the preparation of this monograph chiefly from his interest in the subject of extraperitoneal endometriosis in the abdominal wall, especially in laparotomy scars. The work consists of three sections. The first deals with endometriosis in general, including a review of all the theories of its pathogenesis, the author himself favoring the well known retrograde implantation theory of Sampson.

The second section is probably the most valuable of the three, comprising, as it does, a meticulous study of 193 cases of endometriosis in abdominal scars gathered from the literature, including the author's own fifteen cases. This portion is a storehouse of information for any one interested in this special subject. Here again the author believes that implantation or direct ingrowth is the responsible factor, although in some instances his efforts to apply this concept may seem quite labored. The third division of the work details the author's own experimental studies on the transplantation of endometrium in rabbits, including transplantation into the abdominal wall and in laparotomy wounds. A short summary of the monograph in English, German and French concludes the volume. An excellent bibliography is included, while the illustrations, chiefly reproductions of photomicrographs, are quite good. The translation of Harbitz's work was, according to the author's preface, done chiefly by H. Yourelle, director of the Berlitz School in Oslo, and this may explain an occasional quaintness of term or expression, e. g., "endometriotic," "Sampson complexes." The monograph should be of interest and value to every one interested in endometriosis, and particularly to those who might be seeking a collective review of the subject of endometriosis in laparotomy scars.

Practical Talks on Heart Disease. By George L. Carlisle, M.D., Associate Professor of Clinical Medicine, Baylor University, Dallas, Texas. Cloth. Price, $2. Pp. 153. Springfield & Baltimore: Charles C. Thomas, 1934.

There can be no doubt that there is a real need for a book presenting in simple fashion the practical aspects of heart disease. Such simplicity is fraught with the risk of presenting the subject dogmatically and at times inaccurately. This is the most serious defect in the present volume. This book is not so well suited for the general practitioner getting his first knowledge of the modern aspects of heart disease as for the well versed general practitioner, the internist and even the "embryo" cardiologist. The book presupposes a working knowledge of heart disease. One cannot learn about heart disease solely from reading the book. Its chief asset is the attempt of the author to point out a few of the more important errors commonly made in considering diseases of the heart. This is done in vivid and homely language. The text would have been greatly improved had greater care been given to its style, and none of its forcefulness would have been lost if the language had been somewhat more polished. A style suitable for oral argument is not always appropriate for a manuscript. The vigorous advocacy by the author of the use of special antiserum and vaccine in handling rheumatic fever is unwarranted and unjustified at present in view of the experience of experts in this field. Its dogmatism will not bear critical examination.

Thérapeutique hydro-climatique des maladies non tuberculeuses de l'appareil respiratoire. Par M. Piéry, professeur d'hydrologie thérapeutique et de climatologie à la Faculté de médecine de Lyon. Paper. Price, 20 francs. Pp. 159, with 20 illustrations. Paris: Masson & Cie, 1934.

This is devoted to a discussion of nontuberculous diseases of the respiratory tract. A historical sketch of the treatment by hydrotherapy and climate begins with ancient times and carries through each period to the present. One chapter is devoted to the general action of mineral waters and various climates, which includes a map to show where in France various mineral waters are to be found. Another chapter is devoted to the indications of hydrotherapy and climatic conditions in nontuberculous diseases of the respiratory tract. In this chapter are discussed chronic bronchitis, pulmonary emphysema, asthma and chronic pulmonary suppurations. Roentgenograms of the chest and photographs of patients before and after treatment are reproduced. One chapter, which is profusely illustrated, is devoted to the technic and control of the treatment. The author is quite enthusiastic over the results of the treatment.

Sunshine Preferred: The Philosophy of an Ordinary Woman. By Anne Ellis. Cloth. Price, $2. Pp. 249. Boston & New York: Houghton Mifflin Company, 1934.

This is a highly emotional introspection on the part of a woman evidently afflicted with asthma, who for some unexplainable reason seeks relief in a succession of tuberculosis sanatoriums. She seems to have a perverse urge to do the things that she ought not to do and constantly to court disaster by undertaking what she is physically unable to accomplish. She has a low opinion of doctors; but this is not surprising, since she would not take medical advice except so far as it seemed to please her. The doctor she seems to like best is one who prescribes for her when she is in the Southwest and he is on the Eastern seaboard. It does not appear that he ever examined her. The book would probably make valuable reading for doctors, who might find in it some explanation of why patients sometimes act the way they do. It certainly is not to be recommended for reading by patients, particularly the tuberculous. The book may be good literature but it is certainly not good hygiene.

Keeping Young in Business. By E. B. Weiss and Louis L. Snyder. Cloth. Price, $1.75. Pp. 182. New York & London: Whittlesey House, McGraw-Hill Book Company, Inc., 1934.

Under this intriguing title the authors have set forth in an interesting manner well known principles of physical and mental hygiene. There is nothing particularly new in the book, but the material is fundamentally sound and is well presented. The twenty-five health commandments will warrant careful attention. The business man who has allowed his job to boss him instead of being the boss of his job would do well to read and to heed. An interesting chapter is the one on "Making a Job for Yourself" and pointing out how individuals who have been thrown out of work during the depression have in some instances been able to make new jobs for themselves and thus have rescued themselves not only from economic shipwreck but also from mental and physical deterioration.

Die klinische Röntgendiagnostik der inneren Erkrankungen. Von Dr. Herbert Assmann, o. Professor und Direktor der medizinischen Klinik an der Universität Königsberg i. Pr. Fifth edition. Teile 1 und 2. Paper. Price, 87 marks. Pp. 1248, with 1226 illustrations. Berlin: F. C. W. Vogel, 1934.

A scientific work that goes through five editions in thirteen years does not need any further praise of its merits. A majority of the roentgenologists in this country are familiar with this standard book, probably because the exhaustive presentation of the subject is supplemented by a profusion of excellent roentgenograms, photographs of anatomic specimens, charts and diagrams, thus offering a combination of a reference book and an atlas. The first volume is devoted to a roentgenographic diagnosis of the circulatory organs, mediastinum and respiratory system, including the mediastinum, while the second volume is dealing with the diagnosis of diseases of the gastro-intestinal tract, various abdominal organs such as the liver, spleen and pancreas, the urinary system, the nervous system, the bones, the muscles, the tendons and the subcutaneous tissue. Recent methods of angiography, pyelography, hepatolienography and ventriculography have received due consideration. The author deserves credit for a judicious evaluation of these methods and lack of unwarranted, premature overenthusiasm. Unfortunately, the bibliography entirely disregards foreign literature. In the chapter on examination of the duodenum the author expresses a mythical belief that, contrary to the Viennese school, which advocates fluoroscopic examinations, the American method employs radiography exclusively. Every well trained American roentgenologist is well aware of the fact that fluoroscopy and radiography supplement each other and that, in order to arrive at a correct diagnosis, both methods must be employed. No further adverse criticism can be offered, as the presentation of the subject is complete and clear, the style fluent and the roentgenograms reproduced exceedingly well.

Green's Manual of Pathology. Revised by H. W. C. Vines, M.A., M.D., Pathologist to Charing Cross Hospital, London. American edition edited by Kenneth M. Lynch, M.D., LL.D., Professor of Pathology, Medical College of the State of South Carolina. Fifteenth edition. Cloth. Price, $6.50. Pp. 928, with 425 illustrations. Baltimore: William Wood & Company, 1934.

The first edition of this book was published in 1876. It has been revised and enlarged many times by different editors. From the beginning, so-called American editions have been issued apparently without any other change than in the names of the publishers. Even in the present edition English spelling and nomenclature prevail, which may be of disadvantage to the American student especially in the case of nomenclature. Many of the illustrations do not illustrate and should have been omitted. The text is fairly good in many parts but decidedly poor in spots. There is no escape from the judgment that the many revisions and expansions have resulted in a patchwork and that the book cannot be recommended as desirable for the use of American medical students at this time.

Untersuchungsmethoden für Arzneispezialitäten. Zusammengestellt von der Spezialitäten-Kommission des Internationalen Apothekerbundes: Prof. Dr. H. Thoms, Berlin, Dr. A. Rising, Stockholm, Prof. Dr. H. Baggesgaard Rasmussen, Kopenhagen, Prof. Dr. H. Hérissey, Paris, Prof. Dr. L. Van Itallie, Leyde, und Hofrat Dr. E. Weis, Wien. Unter Mitarbeitung von Dr. E. Höst Madsen, Kopenhagen, und Priv. Doz. Dr. E. Schulek, Budapest. Boards. Price, 5 marks; 3 florins. Pp. 87, with 7 illustrations. Leiden: Fédération Internationale Pharmaceutique; Amsterdam: D. B. Centen's Wetenschappelijken Boekhandel, 1932.

This book describes a series of chemical methods that the Specialty Commission of the International Apothecary Association has chosen as a guide for use in the examination of medicinal products in general, and especially specialty products. Most of the methods are standard and are to be found in pharmaceutic chemistry textbooks but not in as compact form as they are given here. The volume may be considered in two main divisions, the first containing general methods and the second a short outline on the examination of tablets. In addition, there are three short chapters on quantitative alkaloid determinations, one of which bears the name of E. Schulek of Budapest, who was a guest in the A. M. A. Chemical Laboratory several years ago. It must not be considered that such a book can be mastered and that with knowledge so gained one can successfully analyze medicinal products. This type of chemical investigation is possible only if the investigator has the ability to develop new methods and devise applications of older methods to his problems. Ability of this type is the result of experience and cannot come from an outline guide or a book of methods.

The Radiology of Bones and Joints. By James F. Brailsford, M.D., M.R.C.S., Radiological Demonstrator in Living Anatomy, the University of Birmingham. Cloth. Price, $9. Pp. 500, with 310 illustrations. Baltimore: William Wood & Company, 1934.

The author is well known for his many excellent articles, especially on roentgenology of the spine. He credits Mr. Naughton Dunn, one of England's leading orthopedic surgeons, with considerable help in supplying the material for his book. Almost all bone lesions are described and well illustrated by roentgenograms and line drawings. Unusual bone lesions are briefly described and illustrated. The author stresses periodic examination of lesions that cannot be diagnosed on the first roentgen examination. The book is up to date, easily read, and should be of value to all radiologists and bone and joint surgeons.

Medicolegal

Evidence: Qualifications of Expert Witnesses.—The plaintiff was the beneficiary of an accident insurance policy issued to her husband by the defendant company. The insured was found dead in his garage. In an action to recover on the policy, the trial court permitted the coroner, who was not a physician but an undertaker, to testify that the insured died from carbon monoxide poisoning, a cause of death not covered by the policy. From a judgment for the defendant company, the plaintiff appealed to the Supreme Court of Minnesota, after having been denied a new trial.

On appeal, the plaintiff contended, among other things, that the trial court erred in permitting the coroner to testify as to the cause of death. What caused the death of the insured, said the Supreme Court, was for the jury to determine. If the jury could be aided in determining that issue by the testimony and opinion of experts, such testimony was admissible. A physician is generally conceded to be a qualified expert witness as to the cause of death, even though without experience. The criteria of competence of expert witnesses is stated in Jones on Evidence, section 1314, as follows:

> The test to determine whether a witness is qualified as an expert is to inquire whether his knowledge of the matter in relation to which his opinion is asked is such that it will probably aid the trier of the question to determine the truth.

With respect to the competence of the coroner to testify as an expert witness, the Supreme Court called attention to the fact that he had taken a regular three months undertakers course at the University of Minnesota. Sixty hours of that course was devoted to the study of death causes. His instructor had been a physician of the regular staff of the university, from whom he had received instruction relative to symptoms of carbon monoxide deaths. The witness had pursued the business of undertaker since 1922 and during that time had taken care of and prepared for burial some 600 bodies. As coroner, he examined minutely the bodies of those who had died a sudden or violent death. The witness testified as to the observation he had made of the body and surrounding conditions. He carried the body to his place of business, undressed it, examined it closely, and embalmed it within two hours. In so doing, he paid particular attention to the color of the surface tissue, to the color of the blood, and noticed that it did not coagulate. The witness, concluded the Supreme Court, was qualified to aid the jury as to the cause of death, and the trial court committed no error in permitting him to testify. No other error having been found in the case, the Supreme Court affirmed the judgment of the trial court for the defendant company.—*Palmer v. Order of United Commercial Travelers of America (Minn.), 253 N. W. 543.*

Malpractice: Joint Liability of Physicians; Hypothetical Question Based on Hospital Record.—The appellee, Viola Petry, sued the appellants, physicians and surgeons, alleging that the death of her husband was attributable to their joint negligence. The trial court gave judgment against the physicians and they appealed to the court of appeals of Ohio, Stark County.

On January 18, the husband of the appelle became ill, suffering from a duodenal ulcer. Dr. K. E. Reighard, who was called to take care of him, had the patient removed to a hospital, where Dr. L. F. Mutschman was called in consultation. Thereafter the two physicians concluded that a bridge, anchored on a single tooth, should be removed and a dentist was called to do the extraction. The socket bled profusely, and the dentist packed it with gauze. Twenty-four hours thereafter the packing was removed and the socket repacked. The gauze removed was foul smelling. At midnight, January 22, the nurse in charge of the patient made notation on the hospital record that the patient manifested occasional jerking or muscular twitching and hypersensitiveness to noises. On the following morning, January 23, a gastro-enterostomy was performed by Dr. Mutschman, assisted by Dr. Reighard. No immediate change was noted in the patient's condition. In the evening of January 25, however, the patient died of a tetanus infection, the source of which was located in the tooth's socket.

The appellee, the patient's wife, contended that the physicians were *jointly* negligent in not discovering the presence of tetanus, in their failure to use ordinary care in its treatment, and in performing the operation when the patient's condition was so precarious and chances of recovery so remote. It was not contended that the operation was unskilfully done, but that it destroyed the patient's resistance, hastened and directly contributed to his death, and was therefore the proximate cause. The physicians, on the other hand, argued that they were not joint tort feasors or partners. They denied that either was an employee of the other and contended that they must be considered as independent agents, without concert of action, collusion or common design, and that each was responsible only for his own negligence, and nothing more.

In *Village of Mineral City* v. *Gilbow,* 81 Ohio St. 263, 90 N. E. 800, 25 L. R. A. (N. S.) 627, it was stated:

> If there is no concert of action—no common intent—there is no joint liability. . . . But a different principle applies where the injury is the result of a neglect to perform a common duty resting on two or more persons, although there may be no concert of action between them.

In the present case, said the court of appeals, Dr. Reighard recommended and procured Dr. Mutschman. Each had an equal opportunity to diagnose the patient's ailment and to prescribe a remedy. Each consulted with the other, and each advised the operation. Each was present at the time of the operation, one operating, the other assisting. Each participated in and approved of all that was done. There was, therefore, a concert of action and a common purpose and design. A joint action, concluded the court, was therefore maintainable against the physicians.

Hospital records, properly identified, are admissible in evidence. The opinions of expert witnesses in response to hypothetical questions based solely on the facts disclosed by such records are also admissible, even though the facts are not repeated in the questions. The trial court correctly refused to instruct the jury that the skill and care of the appellant physicians were to be judged by that possessed and exercised by "physicians and surgeons practicing medicine and surgery in the city of Alliance or vicinity." The words "in the city of Alliance or vicinity," said the court, improperly limit and confine the degree of care resting on the appellants. The correct rule was laid down in *Whitesell* v. *Hill,* 101 Iowa, 629, 70 N. W. 750, 37 L. R. A. 830, as follows:

> The degree of knowledge, care, and skill required of a physician or surgeon is that which is ordinarily possessed by those practicing in similar localities, and is not necessarily limited to that which is in fact exercised in his particular locality.

And in *Gramm* v. *Boener,* 56 Ind. 497, as follows:

> It will not do, as we think, to say, that if a surgeon or physician has exercised such a degree of skill as is ordinarily exercised in the particular locality in which he practises, it will be sufficient. There might be but few practising in the given locality, all of whom might be quacks, ignorant pretenders to knowledge not possessed by them, and it would not do to say, that, because one possessed and exercised as much skill as the others, he would not be chargeable with the want of reasonable skill.

After considering all the assignments, the court of appeals could find no prejudicial error and consequently affirmed the judgment of the trial court.—*Mutschman et al. v. Petry (Ohio), 189 N. E. 658.*

Society Proceedings

COMING MEETINGS

Medical and Surgical Association of the Southwest, El Paso, Texas, Nov. 22-24. Dr. W. Warner Watkins, Box 1587, Phoenix, Ariz., Secretary.

Pacific Coast Society of Obstetrics and Gynecology, Oakland and Del Monte, Calif., November 21-23. Dr. Clarence A. De Puy, 230 Grand Avenue, Oakland, Secretary.

Puerto Rico, Medical Association of, Santurce, Dec. 14-16. Dr. Julio R. Rolenson, Box 3403, Santurce, Secretary.

Radiological Society of North America, Memphis, Tenn., December 3-7. Dr. Donald S. Childs, 607 Medical Arts Building, Syracuse, N. Y., Secretary.

Southern Surgical Association, Sea Island, Ga., Dec. 11-13. Dr. Robert L. Payne, 142 York Street, Norfolk, Va., Secretary.

Western Surgical Association, St. Louis, December 7-8. Dr. Albert H. Montgomery, 122 South Michigan Boulevard, Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Anatomy, Philadelphia

55: 167-342 (Sept. 15) 1934

Gonad-Stimulating Hormone of Pregnant Mares. H. R. Catchpole, Davis, Calif., and W. R. Lyons, Berkeley, Calif.—p. 167.

Studies on Creeper Fowl: VII. Expression of Vitamin D Deficiency (Rickets) in Creeper Chicks as Compared with Normal Chicks. W. Landauer, Storrs, Conn.—p. 229.

Weight of Principal Components of Normal Hypophysis Cerebri of Adult Human Female. A. T. Rasmussen, Minneapolis.—p. 253.

Dermatoglyphics and Problem of Handedness. H. H. Newman, Chicago.—p. 277.

Development of the Human Pharyngeal Tonsil. T. Snook, Ithaca, N. Y. —p. 323.

American Journal of Cancer, New York

22: 1-248 (Sept.) 1934

*Metastasis in Squamous Carcinoma. L. W. Price, Glasgow, Scotland. —p. 1.

Melanotic Neoplasms of Skin. S. W. Becker, Chicago.—p. 17.

Further Consideration of Ewing's Sarcoma. C. L. Connor, San Francisco.—p. 41.

*Incidence of Vaginal Fistulas in Patients with Carcinoma of Cervix. F. R. Smith.—p. 52.

Pseudomyxoma Peritonei of Appendiceal Origin: Survey of Literature and Report of Case. R. D'Aunoy and A. Fine, New Orleans.—p. 59.

Some Remarks on Growth of Human Fibroblasts in Mediums Containing Copper. J. P. M. Vogelaar and Eleanor Erlichman, New York. —p. 66.

Utilization of Simple Derivatives of Glucose by Mouse Sarcoma. O. O. Meyer, Claire McTiernan and W. T. Salter, Boston.—p. 76.

Ammonia Production by Sarcoma: Sparing Effect of Carbohydrate. W. T. Salter and Phoebe D. Robb, Boston.—p. 87.

Tumors of Tendon Sheaths, Joints and Bursae. C. F. Geschickter and D. Lewis, Baltimore.—p. 96.

Metastasis in Squamous Carcinoma.—Price correlates the results of pathologic investigations with the available clinical data to determine why secondary deposits develop in one case of squamous carcinoma and are absent in another clinically similar case. The evidence indicates that there is no correlation between the clinical condition of the patient and the development of distant metastases. There is no constant relationship between the site of the primary tumor and the site of the distant metastases. The commonest sites for metastases in the series were thirteen cases in the lungs, seven in the liver and five in the kidneys. Less frequently metastases were formed in other sites. From a wider consideration of the development of metastases from numerous primary tumors of various types, the only consistent feature that emerges is that tumors arising in certain primary sites have a tendency to form metastases in certain tissues of predilection. There is a peculiar relationship between the site of the primary tumor and the site of the secondary deposits.

Vaginal Fistulas in Carcinoma of Cervix.—Smith studied the records of 2,852 patients, proved by biopsy to have carcinoma of the cervix and who had received radiation treatment, to determine the incidence of vaginal fistula following this form of therapy. The changes of the technic of radiation therapy are significant in view of the parallel yearly incidence of fistula. From 1922 to 1925 the limitation of unfiltered glass radon seeds to selected cases and the substitution of low voltage roentgen therapy for the external application of radium was accompanied by a decrease in the incidence of fistula as compared to preceding years. With the substitution of gold radon seeds, and with high voltage roentgen therapy replacing the low voltage type, the incidence of fistula was again at a comparatively high level in 1926 to 1928. In 1929 to 1932, with gold seeds omitted from all primary treatments and with roentgen therapy preceding the radium therapy, the incidence of fistula remained consistently low. In 1921, the peak of the era of unfiltered radon seed therapy, the incidence of fistula and the percentage of patients treated with seeds reached the highest levels. Of those patients treated in the years preceding 1926 and who developed fistula there was only one alive in 1933, although several had lived two, three and four years. It seems fair to assume that the advancement of the disease before treatment plays a large part in the incidence of fistula. The yearly incidence in patients now dead parallels closely the yearly incidence in all irradiated patients. A high incidence of fistula is shown in primary carcinoma of the cervical stump. Each patient in this group had a supracervical hysterectomy, for some cause other than carcinoma of the cervix, at least four years before the onset of the symptoms of carcinoma. In the group of primary carcinoma of the cervical stump the incidence approximates that of the recurrent group, suggesting that hysterectomy increases the incidence of fistula, whether performed years before for other reasons or as the initial therapy for cervical carcinoma. The high percentage of fistula patients receiving retreatment in contrast to the relatively small percentage of total patients receiving retreatment indicates the increase in the incidence of the fistula in retreated patients. A comparison of the incidence of fistula in structural types with the type distribution of all cases shows the incidence in the adult type of growth to be only half as high as in the plexiform or in the anaplastic type. This may be due to the relative radioresistance of the adult type. A comparison of the incidence between irradiated and untreated patients shows that fistulas occur at least twice as frequently in untreated as in irradiated patients.

American Journal of Hygiene, Baltimore

20: 259-512 (Sept.) 1934. Partial Index

Nature and Cause of Hookworm Anemia. A. O. Foster and J. W. Landsberg, Baltimore.—p. 259.

*Hookworm Anemia: Etiology and Treatment, with Especial Reference to Iron. C. P. Rhoads, New York; W. B. Castle, Boston; G. C. Payne, San Juan, Puerto Rico, and H. A. Lawson, Providence, R. I. —p. 291.

Comparison of Efficiency of Stoll Egg-Counting Technic with Simple Smear Method in Diagnosis of Hookworm. A. E. Keller, Nashville, Tenn.—p. 307.

Development of Human Hookworm, Necator Americanus, in Guinea-Pigs. B. Schwartz and J. E. Alicata, New York.—p. 317.

Studies of Endamoeba Histolytica and Other Intestinal Protozoa in Tennessee: VIII. Observations on Intestinal Protozoa of Young Pigs and Attempts to Produce Infection with Human Strain of Endamoeba Histolytica. W. W. Frye and H. E. Meleney, Nashville, Tenn. —p. 404.

Anomalous and Nonspecific Reactions with Trichinella Spiralis Antigen in Relation to Other Disease Conditions. G. W. Bachman, R. Rodríguez Molina and J. O. Gonzalez, San Juan, Puerto Rico.—p. 415.

Further Studies on Passive Immunity to Metazoan Parasite, Cysticercus Fasciolaris. H. M. Miller Jr. and Margaret L. Gardiner, St. Louis.—p. 424.

Effect on Vaccine Virus of Certain Lipoid Solvents. W. P. Dearing, Boston.—p. 432.

Precipitation Reactions of Meningococcus Strains with Immune Serum in Agar Plates in Relation to Antigenic Activity. Mary B. Kirkbride and Sophia M. Cohen, Albany, N. Y.—p. 444.

Concerning Presence of Heterophile Antigen in Certain Vegetable Materials. R. R. Hyde, Jeannette Chapman and Charlotte Kiesling, Baltimore.—p. 465.

Study of Production of Somatic and Flagellar Agglutinins in Response to Antityphoid-Paratyphoid Inoculation. E. W. Dennis and D. A. Berberian, Beirut, Syria.—p. 469.

Studies on Benign Tertian Malaria: VI. Heterologous Tolerance. M. F. Boyd, W. K. Stratman-Thomas, Tallahassee, Fla., and H. Muench, New York.—p. 482.

Id.: VII. Some Observations on Inoculation and Onset. M. F. Boyd and W. K. Stratman-Thomas, Tallahassee, Fla.—p. 488.

Comparison of Solar Ultraviolet Radiation in Baltimore and Bogota. A. Peña Chavarría and Paulina Gomez-Vega.—p. 508.

Treatment of Hookworm Anemia.—Rhoads and his associates made studies on eighty-three patients, including children and adults, having anemia and hookworm infection. The patients were selected primarily because they had less than 50 per cent of the normal hemoglobin, had no complicating conditions and had hookworm ova in the stools. Field observations were carried out on thirty-two patients. Hospital patients were maintained on a basal diet resembling closely the usual food of the Puerto Rican peasants. Particular attention was given to the nature of the relationship of the hookworm to the anemia. The relative effectiveness of treatment

of the anemia by removal of the parasites, by improvement of the diet and by the administration of iron or liver extracts was determined. Hematopoietic effects were judged by daily observations of the course taken by the reticulocytes and by determinations of the red blood cell and hemoglobin values of the venous blood on alternate days or at appropriately longer intervals. In the field observations the red blood cell and hemoglobin values were determined from capillary blood at approximately weekly intervals. The study revealed that: 1. The hypochromic anemia of hookworm disease in Puerto Rico is apparently caused by a combination of blood loss, dietary deficiency and gastro-intestinal changes probably resulting from defective nutrition. 2. The removal of the hookworms without other therapy had little effect on anemia or clinical condition. 3. The administration of large doses of iron, with or without the removal of the hookworms, produced rapid improvement of blood values and clinical conditions. 4. The advantages of direct treatment of the anemia with iron are indicated.

Canadian Medical Association Journal, Montreal

31: 347-464 (Oct.) 1934

Second Blackader Lecture on Some Aspects of Virus Infection, with Especial Reference to Virus Diseases of Childhood. J. Craigie, Toronto.—p. 347.
Fractures of Talus. A. Gibson and R. G. Inkster, Winnipeg, Manit. —p. 357.
Rapid Cardiac Failure as Symptom of Acute Leukemia. C. A. Markson, Toronto.—p. 363.
*Blood Iodine Content of Normal and Thyrotoxic Individuals: Iodine Tolerance Test. H. J. Perkin, B. R. Brown and J. Lang, Toronto. —p. 365.
Study of Relative Antirachitic Value of Cod Liver Oil, Viosterol and Irradiated Milk. T. G. H. Drake, F. F. Tisdall and A. Brown, Toronto.—p. 368.
*Convenient Method for Determining Serum and Bile Phosphatase Activity. E. J. King and A. R. Armstrong, Toronto.—p. 376.
Differential Diagnosis of Coma. G. S. Young, Toronto.—p. 381.
Common Duct Stone. R. V. B. Shier, Toronto.—p. 385.
Progressive Exophthalmos Following Thyroidectomy. H. A. Des Brisay, Vancouver, B. C.—p. 389.
Bronchoscopy in Diagnosis of Pulmonary Disease. L. H. Clerf, Philadelphia.—p. 393.
Carcinoma of Jejunum. E. W. Mitchell, Toronto.—p. 395.
Reliable Spinal Block Analgesia. B. C. Leech, Regina, Sask.—p. 397.
Potency and Standardization of Digitalis in Canada. C. W. Chapman and C. A. Morrell, Ottawa, Ont.—p. 400.
Use of Magnesium Sulphate in Cancer. R. P. Wright, Montreal.—p. 404.
Why Late Diagnoses in Malignancy? Analysis of Two Hundred Late Diagnoses. E. E. Shepley, Saskatoon, Sask.—p. 406.
Asthma Due to May Flies (Ephemerida): Case. H. E. MacDermot, Montreal.—p. 408.

Iodine Tolerance Test for Iodine Content of Blood.—For the quantitative estimation of iodine in the blood, Perkin and his collaborators collected 10 cc. of whole blood in a nickel crucible and combusted it with potassium carbonate at 500 F. in a muffle furnace for five hours. The ash was extracted with alcohol and filtered, and the filtrate was evaporated to dryness. The residue from the filtrate was taken up with water and made slightly acid, and the iodide was oxidized to iodate. In forty normal subjects the iodine content was found to vary between 0.00024 and 0.00185 mg. to each 10 Gm. of whole blood. In thirty-nine patients with suspected hyperthyroidism the range for the group was between 0.00072 and 0.0141 mg. of iodine to each 10 Gm. of whole blood. The authors observed that following the oral administration of compound solution of iodine the blood iodine level was increased considerably, varying with the time the blood was taken. This led them to investigate in normal persons the relation of the iodine concentration of the blood with respect to time, following the ingestion of a known amount of iodine. A test was outlined as follows: After a 10 cc. sample of blood had been obtained, 10 minims (0.6 cc.) of compound solution of iodine in milk was given by mouth in the morning, breakfast being limited to one cup of coffee and a piece of toast. Five blood samples were withdrawn at one-half, one, one and one-half, two and one-half and seven hour periods and the total iodine was estimated. The amount of blood taken was reduced to 3 cc., since the iodine concentration was increased from five to fifteen times the normal. During the day normal meals were taken, with the exception that no foods high in iodine content were allowed. Total iodine estimations were made on the urine collected during the twenty-four hour period. Since an abnormal iodine metabolism is considered to exist in persons with hyperthyroidism, the same procedure was used in patients with suspected hyperthyroidism. Analysis shows that the blood iodine concentration did not increase to as high a level in patients with a clinical and histologic picture of hyperthyroidism as in normal subjects. The hyperthyroid curves fall below, while the normal curves rise above the hypothetical line of 10 micrograms. Such a finding might be accounted for on the grounds that a hyperplastic thyroid may have a greater affinity for iodine than a resting gland and thus leave less iodine in the blood stream. However, it may be that there is an increased metabolism of iodine in the hyperthyroid patient, although the amount of iodine excreted in the urine in these cases, in comparison with the normal, would not confirm such a hypothesis. The results indicate that estimating the blood iodine concentration at definite intervals, following the ingestion of a single dose of compound solution of iodine, may be a valuable guide in the diagnosis of hyperthyroidism.

Method for Determining Serum Phosphatase.—King and Armstrong describe a method for estimating serum phosphatase activity in which the enzyme is allowed to act on phenyl phosphate and the liberated phenol is determined. The method is adaptable for use with bile. The time required for duplicate analysis of a serum is about one hour. The accuracy of the method is considered to be as great as or greater than that of previously described methods. The authors believe that the incubation period of thirty minutes as used in their method is of advantage in that it gives results which more truly represent the actual enzyme content of the blood than is the case with methods requiring a longer period of incubation. Theoretically, a proper measurement of the amount of the enzyme should be based on the initial velocity of hydrolysis. While the attainment of this condition is not practicable in a clinical method, the shortening of the period of hydrolysis, without any sacrifice in the accuracy of the analytic procedures, should make for the attainment of more exact and hence more significant values. When large numbers of serums are being examined as a routine, the authors have found duplicate analyses to agree on the average to within 5 per cent for those values lying within the normal range. For the higher values the percentage of error is correspondingly less. A number of serums that they examined simultaneously by their own method and by that of Jenner and Kay agreed closely. Most of the differences are scarcely beyond the combined experimental error of both methods.

Endocrinology, Los Angeles

18: 555-666 (Sept.-Oct.) 1934

Effect of Castration on Anterior Hypophysis of Female Rat. E. T. Ellison and J. M. Wolfe, Nashville, Tenn.—p. 555.
*Comparative Sensitiveness of Schizophrenic and Normal Subjects to Glycerin Extract of Adrenal Cortex. H. Freeman and R. G. Hoskins, Worcester, Mass.—p. 576.
Psychologic Picture of Case of Laurence-Moon-Biedl Syndrome. W. C. Menninger, Topeka, Kan.—p. 583.
Roentgen Therapy of Exophthalmic Goiter. A. M. Smith, Minneapolis. —p. 591.
*Pituitary Headache. W. M. Skipp, Youngstown, Ohio.—p. 596.
Repair of Reproductive System of Hypophysectomized Female Rats by Combinations of Hypophyseal Extract (Synergist) with Pregnancy-Prolan. H. M. Evans, R. I. Pencharz and Miriam E. Simpson, Berkeley, Calif.—p. 601.
Maintenance and Repair of Reproductive System of Hypophysectomized Male Rats by Hypophyseal Synergist, Pregnancy-Prolan and Combinations Thereof. H. M. Evans, R. I. Pencharz and Miriam E. Simpson, Berkeley, Calif.—p. 607.
Hormones of Hypophysis of Infantile Rat. Olive Swezy, Berkeley, Calif.—p. 619.
Concerning Function of Pineal Body. W. Saphir, Chicago.—p. 625.
Nature of Gonadotropic Hormone Found in Urine of Case of Teratoma Testicle. R. J. Main, Richmond, Va., and S. L. Leonard, Schenectady, N. Y.—p. 629.

Sensitivity to Glycerin Extract of Suprarenal Cortex in Schizophrenia.—Freeman and Hoskins administered a glycerin extract of suprarenal cortex to healthy male schizophrenic patients and to normal subjects in a daily dosage representing approximately 450 grains (30 Gm.) of cortical substance. In a first series of subjects in which the medication was administered for two weeks, two of eight normal controls and eight of nine patients showed a pressor reaction. In a second series in which the medication was administered

for four weeks, one of nine normal controls and seven of ten patients showed a pressor response. Combining the two series, 18 per cent of the normal subjects as compared with 79 per cent of the schizophrenic patients showed a pressor reaction. In the first series of patients the mean rise in systolic pressure for the group was 17 mm. In the first series of normal subjects the mean rise in the systolic pressure for the group was 2.6 mm. In the second series of patients the mean rise in systolic pressure for the group was 13.6 mm. and for the diastolic pressure 12.02 mm. In the second series of normal subjects there was no change in the systolic blood pressure of the group. The mean diastolic blood pressure rose 3.73 mm.

Pituitary Headache.—Skipp treated eleven patients suffering from pituitary headache (ten women and one man) with posterior pituitary extract by mouth and subcutaneously, with a disappearance of the headaches. The oral treatment consisted of the posterior lobe extract in tablet form and the injections consisted of a solution of the posterior lobe extract. Extracts of the anterior lobe apparently were without benefit. The author explains the headache by an interglandular syndrome that forces the hypophysis to hyperactivity, thus causing it to hypertrophy. As it is contained in the "small skull within the large skull" there is an increase of intracapsular pressure, which produces pressure on the blood vessels and their nerves and the pituitary capsule and thus causes pain. The sudden and lasting relief received by these patients is remarkable. It is evidently due to shrinking of the oversized gland and relieving the hypophysis of hypofunction. There is indication that there is a pronounced hypofunction in many cases in which characteristic pain in the head called headache would indicate hypofunction.

Journal of Bacteriology, Baltimore

28: 221-322 (Sept.) 1934

Studies on Bacteriophage: I. Relation of Bacteriophage and Other Lytic Agents to Negative Stool Cultures: Study of Two Cases. Genia Rabinowitz, Brooklyn.—p. 221.

Id.: II. Comparison of Action of Lytic Agents and Bacteriophages on Pyocyaneus Cultures. Genia Rabinowitz, Brooklyn.—p. 237.

Spoilage of Olives by Colon Bacilli. R. L. Tracy, Los Angeles.—p. 249.

Studies on Anaerobic Bacteria: I. Corn-Liver Medium for Detection and Dilution Counts of Various Anaerobes. L. S. McClung and Elizabeth McCoy, Madison, Wis.—p. 267.

Mechanical Device Which Prepares and Inoculates Rolled Tubes. R. Thompson, Montreal.—p. 279.

Effect of Deuterium on Growth of Yeast. O. W. Richards, New Haven, Conn.—p. 289.

Investigation of Bacillus Pasteuri Group: I. Description of Strains Isolated from Soils and Manures. T. Gibson, Edinburgh, Scotland.—p. 295.

Id.: II. Special Physiology of Organisms. T. Gibson, Edinburgh, Scotland.—p. 313.

Journal of Experimental Medicine, New York

60: 403-540 (Oct. 1) 1934

Studies on Whooping Cough: I. Type-Specific (S) and Dissociation (R) Forms of Hemophilus Pertussis. G. S. Shibley and Helena Hoelscher, Cleveland.—p. 403.

Comparison of Ocular Micrometric and Projectoscopic Methods of Estimating Growths in Tissue Cultures. H. F. Swift, J. K. Moen and E. Vaubel, New York.—p. 419.

Rabbit Pox: I. Clinical Manifestations and Course of Disease. H. S. N. Greene, New York.—p. 427.

Id.: II. Pathology of Epidemic Disease. H. S. N. Greene, New York.—p. 441.

Existence of Factor Increasing Tissue Permeability in Organs Other Than Testicle. A. Claude and F. Duran-Reynals, New York.—p. 457.

Accumulation of Iron in Tuberculous Areas: IV. Effect of Ferric Chloride on Course of Tuberculosis in Reinfected Rabbits. V. Menkin, Boston.—p. 463.

*Participation of Skin Lymphatics in Repair of Lesions Due to Incisions and Burns. P. D. McMaster and S. S. Hudack, New York.—p. 479.

Irreversible Character of Late Changes After Hepatectomy. P. D. McMaster, New York, and D. R. Drury, Los Angeles.—p. 503.

Biologic Studies of Tubercle Bacillus: III. Dissociation and Pathogenicity of R and S Variants of Human Tubercle Bacillus (H^{37}). W. Steenken Jr., W. H. Oatway Jr. and S. A. Petroff, Trudeau, N. Y.—p. 515.

Lymph Canals in Repair of Lesions Due to Incisions and Burns.—With the aid of solutions of vital dyes, McMaster and Hudack studied the lymphatic capillaries in the ear of the mouse during the period of immediate reaction to injuries of various sorts and during the period of repair. The behavior of lymph canals severed by incision differs greatly from that of the small blood vessels. Instead of closing, they sometimes remain open for as long as forty-eight hours. Materials introduced into the wound pass directly into the lymph canals through their gaping ends, a fact that will explain why infection from incisions is predominant along them. All round an injury the lymph canals are rendered abnormally permeable. So too are the blood vessels, a fact well recognized in the past. From twenty-four to forty-eight hours later, at a time when the blood vessels in the edematous tissue surrounding the injured area are still much more permeable than normal, the draining lymph canals allow far less to escape than usual. The possible reasons for this have been discussed. They participate in the removal of fluid from the edematous tissue. As repair after injury takes place, severed lymphatics may reunite when as yet there are no functioning blood vessels. Later an active hyperplasia of the lymphatic channels occurs, an extraordinarily abundant plexus of minute lymph capillaries budding into the area under repair.

Journal of General Physiology, New York

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Crystalline Acetyl Derivatives of Pepsin. R. M. Herriott and J. H. Northrop, Princeton, N. J.—p. 35.

Convenient Ketene Generator. R. M. Herriott, Princeton, N. J.—p. 69.

Results of Irradiating Saccharomyces with Monochromatic Ultraviolet Light: I. Morphologic and Respiratory Changes. R. H. Oster, Cambridge, Mass.—p. 71.

Theoretical Significance of Talbot's Law. W. Arnold and C. P. Winsor, Cambridge, Mass.—p. 97.

Rate of Escape of Hemoglobin from Hemolyzed Red Corpuscle. H. Fricke, Cold Spring Harbor, Long Island, N. Y.—p. 103.

Conduction in Nerve Fibers. H. A. Blair, Rochester, N. Y.—p. 125.

Journal of Nervous and Mental Disease, New York

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Dupuytren's Contracture One Hundred Years After Dupuytren: Its Interpretation. H. Powers, Wellesley, Mass.—p. 386.

The Unhappiness of Genius. H. H. Hart, New York.—p. 410.

Pupillotonia or Tonic Pupils: Report of Three Cases. G. B. Hassin, Chicago, and J. J. Thompson, North Chicago, Ill.—p. 430.

Kansas Medical Society Journal, Topeka

35: 369-408 (Oct.) 1934

Functions of Anterior Hypophysis. C. M. MacBryde, St. Louis.—p. 369.

Surgical Treatment of Pulmonary Tuberculosis. L. W. Angle, Kansas City.—p. 373.

Rectocolonic Disease. J. L. Jelks, Memphis, Tenn.—p. 375.

Michigan State M. Society Journal, Grand Rapids

33: 533-580 (Oct.) 1934

The Year's Achievement. G. L. Le Fevre, Muskegon.—p. 533.

Medical Education in Michigan. R. R. Smith, Grand Rapids.—p. 537.

Primary Carcinoma of Bronchi. W. D. Mayer, Detroit.—p. 539.

Petrositis. W. S. Gonne, Detroit.—p. 547.

Diphtheria: Some of Today's Problems. D. W. Gudakunst, Detroit.—p. 551.

Relation of Roentgenology to Obstetrics and Gynecology. A. R. Bloom, Detroit.—p. 555.

Adult Health Education Program in Washtenaw County. Gladys J. Kleinschmidt, Ann Arbor.—p. 561.

*Treatment of Impetigo Contagiosa Neonatorum: "Dry Method." S. J. Levin, Detroit.—p. 563.

Papillomas of Larynx: Case Reports. B. F. Glowacki, Detroit.—p. 564.

Treatment of Impetigo Contagiosa Neonatorum.—Levin used the following routine treatment for impetigo of the new-born in forty-four consecutive cases. It has been successful in clearing up these cases in seventy-two hours or less, the average duration being forty-eight hours after the institution of therapy. All mature lesions were opened once or twice a day and the infant was immersed immediately for from ten to fifteen minutes in a bath of 1:15,000 corrosive mercuric chloride and a thorough soap bath was given with a mild castile soap. A dusting powder composed of equal parts of bismuth subnitrate, light zinc oxide and mild mercurous chloride was applied freely following the bath. New lesions were opened twice a day and the bath was repeated. After the first day only an occasional lesion appeared and only one bath was usually necessary. The bath should be continued for a few days after the last lesion appears. The dusting

powder is applied freely during this period to the affected parts. Elsewhere, talcum powder is applied freely two or three times a day, special attention being paid to all folds and creases of the skin. When external heat is indicated, this is obtained best by a light tent rather than excessive clothing.

Nebraska State Medical Journal, Lincoln

19: 361-400 (Oct.) 1934

Carcinoma of Colon. W. A. Fansler and J. K. Anderson, Minneapolis.—p. 361.

*Management of Hemorrhage in Duodenal Ulcer. M. C. Howard and M. W. Barry, Omaha.—p. 367.

Fractures of Forearm. B. R. McGrath, Grand Island.—p. 372.

Diseased Uterine Cervix: Preliminary Report on Schiller's Lugol Test. R. J. Stearns, Omaha.—p. 375.

Trichiniasis: Forty-Six Cases. A. W. Anderson, West Point.—p. 379.

Electrocoagulation on Tonsils. L. C. Knight, Lincoln.—p. 382.

Value of Sequestration Anemia in Surgery. C. H. Newell, Omaha.—p. 384.

Choice of Operation in Biliary Tract Disease. H. H. Everett and R. H. Whitham, Lincoln.—p. 387.

Clinical Pathologic Case Reports: IV. F. L. Rogers and J. M. Neely, Lincoln.—p. 389.

Hemorrhage in Duodenal Ulcer.—The plan of treatment that Howard and Barry have used in hemorrhage in duodenal ulcer, with occasional alterations, is as follows: The patient must remain at absolute rest not only during the time of the active hemorrhage but for a period of from two to three weeks after the stool has become negative. Morphine sulphate is administered for the first few days at frequent intervals to produce this rest. Milder sedatives may be used later. In the more recent cases, especially in patients who are nauseated, vomit or show signs of an excessive tympanites, gastric lavage has been used. This should be done morning and evening, preferably with warm tap water. The regurgitated blood in the stomach is removed and the usual beneficial effects of a gastric lavage are obtained. Since the hemorrhage in these patients depends on the activity of the ulcer, a diet is prescribed immediately, which consists of 3 ounces of milk and cream. This mixture is given at intervals of two hours from 8 a. m. to 8 p. m. These feedings are alternated with sodium bicarbonate, from 20 to 60 grains (1.3 to 4 Gm.) from 9 a. m. to 9 p. m. Tap water is given between the feedings in sufficient quantities to relieve the patient's thirst. On the third to the sixth day, gruels may be substituted for the milk feedings, and, as the hemorrhage is brought under control, the diet is increased. Elimination is regulated by prescribing 1 or 2 ounces (30 or 60 cc.) of liquid petrolatum each day. If needed, enemas should be given every other day and a glycerin suppository may be used occasionally.

New England Journal of Medicine, Boston

211: 563-606 (Sept. 27) 1934

Traumatic Rupture of Kidney with Symptomatology of Acute Abdomen: Case Reports. H. S. Backus, Hartford, Conn.—p. 563.

Ureterorectal Anastomosis in a Woman with Single Kidney Because of Tuberculosis of Bladder. T. N. Hepburn, Hartford, Conn.—p. 564.

Observations on Experimental Transplantation of Ureter. C. H. Neuswanger, Waterbury, Conn.—p. 565.

Urinary Symptoms in Relation to Trichomonas Vaginalis Infestation. E. J. Manwell, New Haven, Conn.—p. 567.

Comparative Histology of Prostate and Prostatic Urethra in Man, Monkey and Rat from Point of View of Anatomic Origin of Prostatic Hypertrophy. R. H. Jenkins, C. L. Deming and Gertrude Van Wagenen, New Haven, Conn.—p. 569.

Application of Bacteriologic, Physiologic and Histologic Principles to Prostatic Surgery. C. L. Deming, New Haven, Conn.—p. 572.

Future of Psychiatry in Medical Schools. A. W. Stearns, Boston.—p. 574.

Tuberculosis of Spine in Children: Based on Study of Eighty-Nine Cases from 1920 to 1930 Inclusive. E. F. Cave, Boston.—p. 578.

Chemical and Electrogalvanic Burns of Tongue. W. J. Macdonald, Boston.—p. 585.

Comparison of Skiodan and Diodrast as Vasographic Mediums, with Especial Reference to Their Effect on Blood Pressure. E. A. Edwards and F. Biguria, Boston.—p. 589.

Bone Plate Screw Holder. A. W. Reggio, Boston.—p. 593.

211: 607-652 (Oct. 4) 1934

*Method of Reduction and Fixation of Intracapsular Fractures of Femoral Neck. J. H. Fay, Melrose, Mass.—p. 607.

Conduct of Convalescent Stage of Anterior Poliomyelitis. H. D. Corbusier, Plainfield, N. J.—p. 611.

Diverticulosis, Diverticulitis and Carcinoma of Colon: Roentgenologic Discussion. R. Golden, New York.—p. 614.

Auricular Fibrillation and Flutter Without Evidence of Organic Heart Disease. R. D. Friedlander and S. A. Levine, Boston.—p. 624.

Apparent Relationship Between Wound Healing and Ovarian Function: Case Report. B. C. Wheeler and D. S. Adams, Worcester, Mass.—p. 630.

Dermatitis of Breasts Caused by Compound Tincture of Benzoin; Report of Three Cases. M. F. Eades, Boston.—p. 632.

Reduction and Fixation of Intracapsular Fractures of Femoral Neck.—Fay outlines a method for the reduction and fixation of intracapsular fractures of the neck of the femur in which the knee of the affected side is flexed to a right angle, the thigh to an angle of 60 degrees and then, with the flexed leg used as a lever, internal rotation of the whole limb is carried out with the thigh adducted. This procedure disengages the fragments. It effectively releases the impinged posterior edge of the distal fragment, which is lying against the proximal fragment. Then, while forced internal rotation is maintained, extension and abduction of the limb follows. This sequence of movements places the fractured surfaces in exact apposition. For maintaining this apposition a sufficient length of time to favor bony union, well padded plaster boots are applied on both legs from the toes to the tibial tubercles. Both legs are held apart in forced internal rotation and abduction by a splint, which is incorporated in the plaster and which serves also to extend moderately the fractured limb by using the sound limb for counterpressure. The fractures are reduced as soon as they are roentgenographed. Reductions are done under gas anesthesia. The patient can receive adequate nursing care without discomfort and may sit up in bed at an angle of 60 degrees as soon as the plaster casts are firm. The fractured limb must be held in abduction at all times. The casts are left in place for ten weeks following reduction. Measurement of the distance between the trochanter and the iliac crest is possible in not too fat patients and is taken frequently. Since the two limbs are abducted equally, this is done by comparative palpation. When the casts are removed, the patient is kept in bed for about two weeks. When the heel of the fractured limb can be raised from the bed without aid, union is sufficiently firm to allow sitting up. Massage is given regularly to the knees and ankles after the removal of the casts and, in another two weeks, walking with crutches or assistance is begun. After this, the patient is allowed to go home and dispense with crutches as soon as walking without them is possible. The author obtained demonstrable bony union in nineteen of twenty-two cases.

Public Health Reports, Washington, D. C.

49: 1101-1128 (Sept. 21) 1934

Mortality Rates by Occupational Class in the United States. R. H. Britten.—p. 1101.

The Woodworth Personal Data Sheet as Applied to Delinquents. M. J. Pescor.—p. 1111.

Radiology, Syracuse, N. Y.

23: 261-390 (Sept.) 1934

Acne Vulgaris and Roentgen Rays: Statistical Report. G. M. MacKee and F. I. Ball, New York.—p. 261.

Differential Diagnosis of Injuries of Spine. H. P. Doub, Detroit.—p. 267.

*Treatment of Chest-Wall Secondaries in Breast Carcinoma: Preliminary Report of New Radium Technic. G. E. Richards, Toronto.—p. 280.

Cumulative Dose with Multiple Fields. M. C. Reinhard and H. L. Goltz, Buffalo.—p. 285.

Clinical Significance of Pneumoperitoneum. L. J. Friedman, New York.—p. 290.

Micronephelometry and Its Application to Certain Radiated Living Tissues. W. M. Millar, Cincinnati.—p. 294.

Pyeloperistalsis Characteristically Altered by Infection, with Notes on Functional Behavior of Other Hollow Viscera. H. A. Jarre and R. E. Cumming, Detroit.—p. 299.

Correlation of Histologic Changes and Clinical Symptoms in Irradiated Hodgkin's Disease and Lymphoblastoma Lymph Nodes. A. Brunschwig and Ernestine Kandel, Chicago.—p. 315.

Roentgen-Ray Visualization of Part of Lymphatic System. L. J. Menville and J. N. Ané, New Orleans.—p. 327.

Stimulating Action of Radioactive Deposits in Body. F. B. Flinn, New York.—p. 331.

Protracted External Irradiation in Treatment of Carcinoma of Mouth and Throat: Comparison Between X-Rays, Five-Gram Pack and Small Radium Pack. I. I. Kaplan, M. Friedman, Rieva Rosh and C. B. Braestrup, New York.—p. 339.

Treatment of Recurrent Skin Lesions in Breast Carcinoma.—In treating recurrent lesions in the skin and subcutaneous tissues of the wall of the chest following the surgical treatment of primary carcinoma of the breast, Richards uses a method that consists in fitting to the patient's body a radium

applicator, which he calls "the radium jacket." The foundation of this jacket consists of a layer of felt 0.5 cm. thick, which is fitted to the patient's body. To this, rows of radium needles are stitched on and spaced accurately from one another, so arranged as to provide even irradiation of the entire wall of the chest, from the midline in front round posteriorly as far as it is thought desirable to extend the jacket. When sufficient needles have been attached to the felt to cover the desired area, the whole package is enclosed in pure gum rubber and sealed, and in this form the jacket is applied to the patient's chest and the patient wears it for a period of time which is determined by the radium content of the needles and the filtration of their wall. The needles, 60 mm. in length, which have been used for this purpose, contain 3 mg. of radium element and have a wall thickness of 0.8 mm. of platinum of the standard platinum iridium type. Approximately 100 of these needles are used in the full radium jacket and, with the high filtration resulting in a hard gamma ray radiation and the distance from the skin, it is necessary to leave them in position from ninety to 100 hours in order to secure the desired effect. The reaction that follows is a fairly severe first to second degree erythema with vesication and requires care in its treatment. The application of a cream consisting of equal parts by weight of zinc oxide and castor oil is applied immediately following the removal of the jacket and until the reaction has healed entirely. The cream is applied thickly on gauze and the bandage is changed morning and night. The author states that up to the present time there has not been a case in which local secondaries developed following the foregoing procedure. The disadvantages of the method are that in several cases there has been a rather severe constitutional reaction, accompanied by rise of temperature and a moderate degree of shock, which has required the hospitalization of the patient for several weeks and that, if the treatment fails to control the disease, it results in a fairly marked degree of devitalization of tissue and subsequent treatments by any method are rendered difficult or impossible.

Review of Gastroenterology, New York

1: 183-260 (Sept.) 1934

Mimicry of Acute Appendicitis by Malaria. S. M. Copland and C. J. Miangolarra, New Orleans.—p. 183.

*Donor's Diet as Possible Cause of Blood Transfusion Reactions. A. S. Price, New York.—p. 192.

Use of Fats in Gastric and Hepatic Diseases. P. Fruictier, Vichy, France.—p. 202.

Cardiospasm: Report of Case of Twenty-Eight Years' Duration Terminating in Complete Obstruction. R. Finkelstein, Brooklyn.—p. 207.

The Hepato-Endocrine Syndrome. M. E. Binet, Vichy, France.—p. 213.

Relationship of Pulmonary Tuberculosis to Gastro-Intestinal Tract. E. Granet and G. G. Ornstein, New York.—p. 217.

Diet of Donor as Possible Cause of Blood Transfusion Reactions.—To determine the cause of reactions following blood transfusion, Price observed the diet of the donor preceding the transfusion. During the last ninety of 300 transfusions he made a decided effort to eliminate food as a possible cause for reaction by asking the donor to omit his last meal prior to the transfusion. For purposes of comparison, in the first 210 cases the attempt to curb the diet of the donor was not pushed and fifty-eight reactions occurred, or 27.5 per cent. In the last ninety cases in which an effort was made to curb the diet, ten reactions occurred, or 11 per cent. In six cases of the latter group, the donor had had something to eat within the five-hour period. Thus, if one is willing to accept the diet of the donor as a factor in producing reactions, the unexplained reactions in the last ninety cases might be reduced to three, or 3.3 per cent. One reaction was believed to be due to repeated collapse of the donor's vein. Of 125 cases in which the donor had had no food within the five-hour period, ten had a reaction. Four of the reactions were attributed to faulty technic, leaving six that occurred in the entire group in which no food was taken within the five-hour period. Of 125 cases in which the donor is known to have taken food within the five hours prior to the transfusion, 35 per cent had a reaction. The only desirable deduction is that the majority of unexplained reactions in blood transfusions may be avoided by controlling the donor's pretransfusion diet. At present, if any foods are to be classed as "vicious," among them would be milk, meat, eggs and gruels. The exact causative reaction factor is not known, but it is believed to be protein in nature. Observation has led to the belief that it is advisable to ask the donor to omit coffee because of the cream used. At present, only orange juice is the recommendation given the donor for his pretransfusion diet. Such a recommendation is applicable only to the elective transfusion.

Rhode Island Medical Journal, Providence

17: 143-162 (Sept.) 1934

Importance of Early Diagnosis in Urology. M. A. Chapian, Providence.—p. 143.

Some Medical Aspects in Treatment of Pulmonary Tuberculosis. U. E. Zambarano, Providence.—p. 148.

17: 163-178 (Oct.) 1934

*Pneumonectomy: Successful Result in Case of Bronchiectasis. E. Widssberg, Providence.—p. 163.

Physical Symptoms from Psychologic Sources. W. C. Weigner, Providence.—p. 167.

Salygran: Its Use Over Extended Period of Time to Relieve Cardiac Insufficiency. L. I. Kramer, Providence.—p. 175.

Physiotherapy and Infections of Hand. E. A. Bowen, Cranston.—p. 176.

Pneumonectomy and Bronchiectasis.—Of the six cases of successful pneumonectomy, the one that Windsberg reports, a case of bronchiectasis of a duration of five and a half years in a girl of 12 years, involved the right lung, whereas the other five involved the left lung. When bronchiectasis, not amenable to postural drainage and bronchoscopic therapy, is confined to one lobe of a lung, lobectomy offers a reasonably good prospect for a complete cure. The method of Graham not only establishes drainage but also destroys diseased lung tissue in multiple stages. In the author's case the method of Graham was employed to begin with because of the multiple cavities and the extensive involvement. Amputation at the hilus was effected at the fourth sitting when it appeared relatively safe. On the other hand, pneumonectomy as a primary procedure would have been hazardous in this case. The wound in the wall of the chest has healed completely except for the opening of a small bronchial fistula high up in the axilla, the size of a pinhead. The fistula has closed, only to open again, on several occasions. Injection of iodized oil shows it to be about 1½ inches in length and to lead directly to the stump of the main bronchus. It is felt that a partial thoracoplasty may be required to effect permanent closure of the fistula as well as to overcome the extreme deviation of the trachea to the right. During the past year the patient has gained in weight and in height. She has carried on well under unfavorable home conditions. Moderate dyspnea develops only following considerable exertion. Cough and expectoration are insignificant and are due entirely to the presence of the bronchial fistula. Since September 1933 she has been attending school for the first time in her life.

South Carolina Medical Assn. Journal, Greenville

30: 177-192 (Sept.) 1934

Intracranial Hemorrhage Without Paralysis. W. R. Mead, Florence.—p. 179.

Trends in Medical Economics. R. G. Leland, Chicago.—p. 183.

Texas State Journal of Medicine, Fort Worth

30: 303-364 (Sept.) 1934

Foundation of Art and Science of Medicine. J. H. J. Upham, Columbus, Ohio.—p. 307.

Consideration of Carcinoma Problem as Especially Applied to Carcinoma of Uterus. J. C. Masson, Rochester, Minn.—p. 312.

Surgical Procedures for Relief of Intractable Pain. A. O. Singleton, Galveston.—p. 318.

Development of Peroral Endoscopy. J. H. Foster, Houston.—p. 322.

Use of Mucin in Treatment of Intractable Peptic Ulcer. G. M. Underwood, Dallas.—p. 328.

Mottled Enamel of Teeth in Children: Résumé with Consideration of Clinical and Etiologic Factors. J. R. Lemmon, Amarillo.—p. 332.

Accidental Transmission of Quartan Malaria in Opium Addicts. P. A. Woodard, Galveston.—p. 336.

*Molds in the Etiology of Asthma and Hay Fever: Preliminary Report. H. E. Prince, W. A. Selle, Galveston, and Marie Betzner Morrow, Austin.—p. 340.

Pathologic Basis of Renal Insufficiency. J. P. Simonds, Chicago.—p. 344.

*Trichomonas Vaginalis Vaginitis: Preliminary Report. K. J. Karnaky, Houston.—p. 348.

Blood Transfusion in Infancy and Childhood. W. H. Bradford, Dallas.—p. 352.

Molds as Etiology of Asthma and Hay Fever.—Prince and his associates have encountered cases of severe asthma, both with and without hay fever, that have defied all attempts

at etiologic diagnosis and consequently have received little benefit from therapy. These cases for the most part appear in the fall, about October, and persist with remissions until March or April. The remissions are experienced generally during warm clear weather when the wind is from the Gulf. They began a series of air-borne mold cultures in June 1933. From the roof of a building, sterile plates of Sabouraud's agar were exposed to the air for intervals of two minutes each. These plates were allowed to incubate at room temperature until colonies appeared, which usually required from five to seven days. It was somewhat surprising to find that these short exposures usually resulted in one colony, sometimes more, on each plate. When the time of exposure was increased to five minutes, the colonies were so numerous that mutual contamination could not be avoided. Several cultures of molds were obtained also from the air within doors. In three instances the cultures were obtained from known sources: mold 10, cultured from corn smut, mold 27 from a trichophyton and mold 28, which was an alternaria. Thus, the authors obtained twenty-nine different cultures during the months of June and July. The colonies generally assumed enough gross characteristics within a week to be roughly differentiated, after which they were fished off and inoculated into liquid Sabouraud's mediums in 1,000 cc. flasks for quantity yields. After all growth had ceased in the flasks, which required usually from fifteen to twenty days, the pellicles with all spores and mycelia were carefully removed, washed to remove the culture mediums and dried in individual desiccators over calcium chloride. Weighed amounts of the dried material were ground in a mortar and extracted for forty-eight hours in a medium containing one third Coca's fluid and two thirds glycerin, all extractions being carried out in the ratio of 1 Gm. of mold to 40 cc. of extracting fluid (2.5 per cent). The extracts were then subjected to Berkefeld filtration and the sterile extracts stored in rubber-stoppered bottles and numbered. A double check for sterility was performed, one plating being made on Sabouraud's agar to determine whether any spores had escaped filtration and a second on ordinary nutrient agar to check for bacteria. Testing sets were prepared from these stock solutions by simple dilution, Coca's solution alone being used as the diluent, so as to avoid a high concentration of glycerin. Two sets of dilutions were prepared, 1:2,000 and 1:500. All the subsequent testing was performed by the intracutaneous method, 0.02 cc. being introduced into the superficial layer of the skin in the usual manner. In no case was the 1:2,000 dilution found to be too strong; the less sensitive cases were tried on the 1:500 extract. It was not found necessary to run control tests on the patients, because in each instance several extracts failed to react and these were considered negative. Altogether the authors have tested eighteen patients with their mold extracts. Four normal medical students gave negative reactions. In two asthmatic and one hay fever patient, results were likewise negative; eventually other causative factors were found. Three other asthmatic patients, in whom the cause is known to be a bronchial infection, have reacted strongly to certain of the molds; in two the injections of mold extracts were without benefit, while the third was not treated. Another asthmatic patient sensitive to house dust gave positive reaction to three molds but was treated with dust extract because his symptoms occur chiefly in Austin, Texas, where molds are much less abundant. A difficult hay fever patient is making good progress with mold therapy. The author discusses the six remaining cases that gave positive reactions to molds in which mold therapy has been distinctly encouraging.

Trichomonas Vaginalis Vaginitis.—Karnaky presents a method for the diagnosis of Trichomonas vaginitis that may be useful to those who have not examined many smears or who are not familiar with this organism. With this method, a few drops of dilute gentian violet stain is mixed well with the smear on the slide. The epithelial cells, pus cells and débris are stained purple; the parasites are not stained at first but may be seen swimming around in a purple surrounding. Later they will take in some of the purple granules and will have a purplish tint. The warm dilute gentian violet preparation is made by adding 6 or 8 drops of gentian violet to 5 cc. of warm tap water.

United States Naval Med. Bulletin, Washington, D. C.

32: 381-576 (Oct.) 1934

Syphilis in the Navy. R. P. Parsons.—p. 381.
Incidence of Yaws and Syphilis in Five Rural Villages, Republic of Panama. P. W. Wilson.—p. 391.
Christopher Columbus and the American Origin of Syphilis. R. C. Holcomb.—p. 401.
Should We Standardize Treatment of Early Syphilis? H. L. Jensen and J. M. Wheelis Jr.—p. 430.
Hemolytic Jaundice: Report of Two Unusual Cases with Results Following Splenectomy. C. W. Brunson.—p. 441.
Surgery of Spleen: Report of Two Cases of Hemolytic Jaundice Treated by Splenectomy. J. A. Biello.—p. 449.
Medical Observations in Tropics. E. U. Reed.—p. 463.
Vincent's Disease. W. H. Short.—p. 467.
Local Anesthetic Solutions. E. H. Tennent.—p. 487.
Alcoholism and Pellagra. S. R. Mills.—p. 493.
Systematic Study of Three Hundred and Three Cases of Syphilis with Use of a "Graph" for Aid in Comprehension. L. E. McDonald.—p. 497.
Plea for Adequate Antisyphilitic Treatment. G. H. Ekblad.—p. 506.

Virginia Medical Monthly, Richmond

61: 377-438 (Oct.) 1934

Tumors of Sympathetic Nervous System. D. Lewis, Baltimore.—p. 377.
Metastatic Septic Endophthalmitis. H. S. Hedges, Charlottesville.—p. 383.
*Simplified Treatment of Eclampsia. M. P. Rucker, Richmond.—p. 384.
Narcolepsy: Case Report. R. Brittain and L. F. Hobbs, Jewel Ridge.—p. 387.
Diathermy for the Physician in General Practice. J. O. Fitzgerald Jr., Richmond.—p. 388.
Problem of Hair Growth. T. W. Murrell, Richmond.—p. 391.
Diabetic Coma Without Ketonuria: Case Report. C. H. Beach, Richmond.—p. 395.
Autobiography of a Doctor's Saddlebag. R. H. Garthright, Vinton.—p. 401.
Cerebrospinal Fever. L. Farley, Courtland.—p. 402.

Simplified Treatment of Eclampsia.—To stop convulsions, Rucker's main reliance has been the intravenous administration of magnesium sulphate. He gives 20 cc. of a 10 per cent solution. If the convulsions recur, he repeats it once or twice. When the magnesium sulphate failed, he has used sodium amytal intravenously. External stimuli, such as noise, bright lights and jarring the bed, should be avoided. Rest cannot be emphasized too strongly. For this reason the author has abandoned colonic irrigation and gastric lavage. If the patient is in labor he gives morphine and scopolamine or sodium amytal and scopolamine so as to keep her as comfortable as possible in the first stage. For second stage anesthesia he prefers local infiltration of the perineum with 0.5 per cent procaine hydrochloride. To avoid the suppression of urine, he gives plenty of water. If the patient is conscious, she is encouraged to drink water and weak lemonade. Otherwise, a pint of water is poured into the stomach through a nasal tube every eight hours. If more is necessary, hypertonic solution of dextrose may be given intravenously. Edema of the lungs is combated with digitalis. He gives half a cat unit dose of digitalis as early in the treatment as possible. When this is done, edema of the lungs does not develop. When the patient is brought in after a number of convulsions and she has already begun to froth at the mouth, he believes that it is wise to take from 500 to 600 cc. of blood from a vein. After the convulsions are controlled, the treatment is tapered off with small doses of sodium amytal, 3 grains (0.2 Gm.) two or three times a day, or with sodium bromide and chloral hydrate. For several days the diet should consist of fruit juices. On the whole, the author thinks that it is unwise to allow the patient to leave the hospital undelivered. However, there are exceptional cases that can be carried closer to term under careful supervision. He has treated 123 consecutive cases of eclampsia, with a gross mortality of less than 5 per cent.

Wisconsin Medical Journal, Madison

33: 721-796 (Oct.) 1934

Clinical Signs, Considerations and Therapy of Brain Tumors. H. H. Reese, Madison.—p. 734.
Limitations of Intravenous Urography. H. W. Hefke, Milwaukee.—p. 742.
Bromism: Review of More Recent Literature and Analysis of Sixteen New Cases. Annette C. Washburne, Madison.—p. 746.
Thrombophlebitis of Lateral Sinus. F. S. Cook, Eau Claire.—p. 751.
Malignant Intraspinal Meningioma: Case Report. D. J. Twohig, H. A. Devine and M. O. Boudry, Fond du Lac.—p. 759.
Traumatic Rupture of Sigmoid with Intra-Abdominal Hemorrhage. G. M. La Croix, Shiocton, and C. E. Ryan, Appleton.—p. 760.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Tuberculosis, London

28: 105-152 (July) 1934

Tuberculosis in Wales. H. D. Chalke.—p. 109.
*Influences Adverse to Tuberculous Patients. J. A. G. Keddie.—p. 117.
Alpine Climate in Connection with Laryngeal Tuberculosis: Notes. T. Rüedi and B. Hudson.—p. 126.
Gold Treatment of Pulmonary Tuberculosis. C. Mayer.—p. 131.

Influences Adverse to Tuberculous Patients.—Keddie, in a survey of 262 cases, observed that a large proportion of the cases of pulmonary tuberculosis are reported to the public health authority when the disease is far advanced and that, therefore, in comparatively few instances can one expect ultimate permanent arrest of the lesion. The majority of cases, whether early or advanced in type, fail to secure adequate initial residential treatment. While the medical practitioner is partly responsible for so many patients presenting themselves for public medical treatment at a late stage, the patient is more at fault. Though lack of education in regard to the need for early and adequate treatment is commonly the factor at work, domestic difficulties are not infrequently the important causal influences. On return from residential treatment the patient has in many cases to face housing conditions that are almost certain to be deleterious to his health, and in many instances inadequate food is an adverse influence, being usually present as a result of the inability to secure suitable work for which there is physical capacity. The author is of the opinion that, in order to secure the amelioration of the conditions under which tuberculous patients and their families so commonly live, conditions which undoubtedly cause the patients to relapse or hasten their deaths, and which are practically certain to lower markedly the resistance to infection of the house contacts, there is urgent need for the rehousing of many cases and for the establishment of a care and after care organization.

British Medical Journal, London

2: 499-538 (Sept. 15) 1934

Differential Diagnosis of Functional and Organic Nervous Disorders. G. Riddoch.—p. 499.
Id. A. A. W. Petrie.—p. 503.
*Mechanical Transmission of Trypanosomiasis, Leishmaniasis, and Yaws Through Agency of Nonbiting Hematophagous Flies: Preliminary Note on Experiments. J. G. Thomson and W. A. Lamborn.—p. 506.
Postoperative Complications and Results of Tonsil and Adenoid Operations in Children. B. Elizabeth Nesbitt.—p. 509.
*Pulmonary Tuberculosis in Asthma Cases. E. M. Fraenkel.—p. 513.

Transmission of Trypanosomiasis, Leishmaniasis and Yaws.—Thomson and Lamborn point out that nonbiting hematophagous muscids feed readily to repletion on blood, serum, serous exudate, ulcers, sores and also secretions from the nose, eyes and mouth. After a meal a certain proportion of these flies pass blood or serum in their numerous dejecta, which may contain large numbers of living trypanosomes, leishmania or the Treponema pertenue of yaws. These hematophagous flies have their preferred hosts: Musca spectanda Wied favors man. It lays its eggs exclusively in human feces, breeding freely. It derives moisture from human feces and could thus take up Leishmania donovani from this source, since the organism is known to occur sometimes in this medium. Large numbers attack persistently and with determination scratches, cuts and sores of the skin of man in search of food and also haunt the eyes, nose and mouth in search of fluid. Trypanosoma brucei in the blood of rats and dogs are readily ingested by Musca spectanda and during a period varying between five minutes and six hours these flagellates can be passed alive in the numerous droplets of dejecta passed through the intestine of the fly. Rats were experimentally infected by the intraperitoneal injection of these dejecta by a drop placed on a fresh cut on the ear and by the dejecta placed on a drop of blood exuding from the bite of a tabanid. Trypanosoma brucei in the dejecta introduced into the eye, nose and mouth did not produce infection. Certain flies after a feed extrude a drop of the ingested blood containing living trypanosomes from the proboscis from five to ten minutes after a full meal. Living leptomonads in cultures of Leishmania donovani, infantum (dog strain) and tropica are freely ingested by Musca spectanda and are passed viable in the droplets of excreta for several hours after a feed. There can be no doubt that these flies could ingest the round tissue forms of all the human forms of leishmaniasis and pass them in a viable state either through the intestine or by regurgitation from the proboscis to sores or mucous membranes. It would seem certain that both kala-azar and oriental sore might be actively transmitted through the agency of these flies. The Treponema pertenue of yaws passes rapidly in a viable form through the intestine of Musca spectanda and so might be deposited easily on cuts and abrasions.

Pulmonary Tuberculosis in Asthma Cases.—Of 369 cases, sent to Fraenkel, diagnosed as bronchial asthma, investigation showed that active tuberculosis was present in sixteen. In two instances a suggestive history was obtained. In one the undiagnosed patient's wife developed tuberculosis of the eyes and in another two children had tuberculous meningitis and pulmonary tuberculosis. It would appear that tuberculosis may become established after asthma alone has been recognized. The asthma may, as a result of an allergic predisposition, be at first monovalent, later becoming polyvalent. The possibility of a secondary hypersensitiveness to tuberculous allergens now arises. Thus, a chemist's assistant who possessed a sensitization to sodium salicylate with typical asthma later developed a rapidly progressive exudative tuberculosis with persistence of the asthmatic picture. There could be no doubt that this patient had previously been completely free from tuberculosis. Another case was that of a medical man who had had asthma practically all his life and became infected with tuberculosis while working in the tuberculosis department of a hospital. This infection led to cavity formation and after treatment was followed by healing. The history of the patient frequently shows an "influenza" infection or a catarrh of the apex. In some of such cases there is found an inactive tuberculosis, which can be demonstrated only by roentgenograms. The most important aspect of these observations is the fact that an active and open tuberculosis can be concealed for a lengthy period under the guise of a bronchial asthma with both eosinophilia and skin reactions against specific proteins.

Glasgow Medical Journal

4: 89-160 (Sept.) 1934

William Mackenzie, M.D., Founder of Glasgow Eye Infirmary and First Lecturer on Diseases of Eye in University of Glasgow. A. M. Ramsay.—p. 89.
*Aneurysm of Popliteal Artery. J. Dunbar.—p. 102.

Aneurysm of Popliteal Artery.—Dunbar reports a case that presented an expansile swelling in the middle of the lower half of the left popliteal space. Pressure over the superficial femoral artery caused the pulsation to disappear. There was slight delay of the pulse in the left posterior tibial artery. Slight venous congestion of the leg was present with enlargement of the superficial veins, especially one from the upper end of the short saphenous running upward and inward to the long saphenous. There was no difficulty about the diagnosis. Roentgen examination failed to show any definite shadow corresponding to the aneurysm. To investigate the shape of the aneurysm, neo-iopax was injected into it through a fine needle. Roentgenograms showed the aneurysm to be of the fusiform variety, with a marked constriction of the artery about 1 inch below the aneurysm. The artery was slightly dilated between the aneurysm and the constriction. To open up an efficient collateral circulation, pressure by means of a tourniquet (Skey's) was applied to the superficial femoral in Hunter's canal. The patient was able to carry out the treatment unaided. At first he could keep the tourniquet in position for only five minutes at a time. This was repeated three times a day and the length of time was gradually increased until in three weeks he could stand it for thirty minutes without discomfort. A posterior median vertical incision was made over the swelling, the large vein noticed on examination being avoided. The sac was easily found and the vein and nerve, lying on its outer posterior aspect, were carefully dissected from the sac. After the sac had been completely exposed it was found impossible to expose the constriction of the artery without causing considerable damage to the nerves. Therefore the aneurysm was removed between ligatures. The patient was discharged from the hospital fourteen days later, having made an uneventful recovery.

Journal of Tropical Medicine and Hygiene, London

37: 257-272 (Sept. 1) 1934

Elephantiasis Nostras (Nonfilarial Elephantiasis). A. Castellani.—p. 257.
Pellagra in Sudan. N. L. Corkill.—p. 265.

Lancet, London

2: 523-578 (Sept. 8) 1934

Concomitant Squint and Its Treatment. L. H. Savin.—p. 523.
Disturbances of Body Temperature. C. E. Lakin.—p. 526.
Further Observations on Filarial Periodicity. G. C. Low and P. H. Manson-Bahr, laboratory report by A. H. Walters.—p. 531.
Treatment of Exophthalmic Goiter with Deep X-Ray Therapy. E. P. Poulton and W. L. Watt.—p. 535.
Vaporized Iodine with Bier's Modified Hyperemia in Treatment of Pyogenic Cutaneous Affections. A. Strickler.—p. 537.
"Curious Bodies" Found in Lungs of Coal Workers. Enid Williams.—p. 541.

2: 579-632 (Sept. 15) 1934

Arterial Hypertension. O. L. V. de Wesselow.—p. 579.
*Disturbances of Body Temperature. C. E. Lakin.—p. 586.
Injection of Gasserian Ganglion. H. S. Souttar.—p. 592.
Iron in Treatment of Splenic Anemia. L. S. P. Davidson.—p. 593.
Delayed Chloroform Poisoning. T. F. Todd.—p. 597.
Colles's Fracture. S. Holzman.—p. 598.

Disturbances of Body Temperature.—Lakin observed that metabolism is responsible for heat production, that a center in the hypothalamus is concerned with the regulation of body temperature and that the center is so constituted as to be sensitive to the temperature of the blood passing through it. If this temperature is raised, the various means for increasing the loss of heat and decreasing its production are brought into play. If the temperature is lowered, those for decreasing the loss of heat and for increasing the production of heat become operative. The thyroid and suprarenal acting through the sympathetic nervous system influence metabolism and together form a "humoral apparatus" (Cramer) concerned in the regulation of the heat of the body. The heat center may be regarded as a group of nerve cells representing the central connections of the sympathetic. When it is considered that during muscular exercise the production of heat may be increased from 200 to 300 per cent without the temperature rising, whereas in fevers production of the heat may be increased only from 20 to 30 per cent and yet pyrexia results, it is obvious that in cases of fever some lack of adjustment must occur. In infective conditions pyrexia must be regarded as the resultant of two forces: the toxic action of the invading organism on the one hand and the resistance of the infected person on the other. Such a conception is borne out when the temperature chart is studied in conjunction with the curve of the opsonic index. The elevations on the temperature chart correspond to depressions of the opsonic curve and vice versa; that is, the temperature chart bears an inverse relationship to the opsonic activity. Since aseptic suppuration is accompanied by fever, some investigators ascribe the fever and chills that occur in cases of suppuration to the absorption of autolytic products rather than to the direct action of poisons produced by the invading organisms. The rise of temperature that occurs when a patient gets up too soon after a pyrexial illness is to be ascribed to the increased cardiac action (consequent on the increased exertion) washing out inflammatory products from the affected area into the general circulation. The occurrence of pulmonary infections after anesthesia is perhaps favored by the thyroid and suprarenal exhaustion that follows the exhibition of general anesthetics.

Medical Journal of Australia, Sydney

2: 273-304 (Sept. 1) 1934

The Rheumatic Child. E. B. Jones.—p. 273.
Adenohypophyseal Dystrophies of Infancy and Childhood. L. Dods.—p. 277.
Epilepsy from Pediatric Point of View. W. S. Laurie.—p. 286.

South African Medical Journal, Cape Town

8: 589-628 (Aug. 25) 1934

What Do We Think With? E. G. D. Drury.—p. 591.
Indications for Cesarean Section. E. C. Crichton.—p. 595.
Behavior Disorders in Infancy and Childhood. G. K. Cross.—p. 597.
Some Musings of a General Practitioner. H. J. Leviseur.—p. 601.
Health Importance of Preschool Life. A. J. Milne.—p. 604.

Presse Médicale, Paris

42: 1401-1416 (Sept. 8) 1934

Hyperthyroid Heart and Cardiothyroses. L. Bérard and P. Colson.—p. 1401.
*Possibility of Local Vitamin Insufficiency: Theoretical Considerations and Therapeutic Application. S. Balachovski.—p. 1404.

Local Vitamin Insufficiency.—Balachovski believes that the only proof of a local vitamin insufficiency lies in the therapeutic results of supplying the vitamin locally. In attempting to answer this question he used a colloidal preparation of carotene for local application. The direct application of this preparation at the site of different local conditions resulted in numerous successful therapeutic effects and often in a remarkable analgesia. Without desiring to formulate the indications for local carotene therapy, he believes that its study is interesting in superficial ocular lesions (conjunctivitis, keratitis, ultraviolet lesions, certain forms of trachoma, and so on), gingivitis, cracks of the breasts, anal fissures, burns and a few other similar local abnormalities.

42: 1417-1440 (Sept. 12) 1934

Variations in Relationship of Cholesterol Esters to Total Cholesterol in Pathology. G. Laroche, A. Grigaut and Costes.—p. 1417.
Hepatic Cirrhosis and Gynecomastia. L. Capriglione, W. Berardinelli and F. da Costa Cruz.—p. 1419.
*Early Diagnosis and Treatment of Intestinal Invagination of Nursling. E. Pouliquen.—p. 1421.

Intestinal Invagination of Nursling.—Pouliquen discusses the diagnosis and treatment of intussusception in infants. When the classic signs of occlusion, restlessness and bloody stools exist, the diagnosis offers no difficulties. When, however, the bloody stools are delayed or absent, this diagnosis is much more difficult to make at the first visit. Vomiting, colic and palpation of a filled intestinal loop are also frequently helpful. Rectal examination often clarifies the diagnosis because of the palpable mass or because blood tinged stool or mucus is often obtained. Roentgenologic examination is of great importance. In fact, the author feels that when invagination is suspected the physician should think immediately of the x-rays and the possibility of obtaining consultation by telephone. Two types of treatment come under consideration. These are enemas and operation. The author feels that one or two barium enemas suffice and, if the massive passage of barium into the small intestine occurs accompanied by disappearance of the palpable filled intestinal loop, proof of its effectiveness exists. Operation when used should be performed immediately and rapidly and should involve the tactile reduction of the invagination. Resection is rarely successful.

Policlinico, Rome

41: 573-632 (Oct. 1) 1934. Medical Section

*Action of Hormones and Mercurial Diuretics on Evolution of Histamine Blister. P. Steffanutti and E. Jantria.—p. 573.
*Clinical and Roentgenologic Contribution to Treatment of Gastroduodenal Ulcer with Injections of Sodium Benzoate. R. Liberti.—p. 581.
Pulmonary Metastatic Echinococcosis: Case. V. Maccone.—p. 600.
Amino Acids in Typhoid. A. Valentini.—p. 617.

Action of Hormones and Mercurial Diuretics on Evolution of Histamine Blister.—Steffanutti and Jantria state that the histamine blister is made up of two fundamental factors, the first of which is exclusively vascular by nature and is due to capillary dilatation and transudation of plasma fluid from the capillary walls. The second phase is a condition of local edema produced by stagnation of the transudate in the meshwork of the cutaneous tissues. The authors studied the influence of such important hormones as epinephrine, solution of pituitary, thyroxine, insulin and extract of the anterior hypophysis and of mercurial diuretics on the second stage of the blister. They observed a diminution of the blister when extracts of the hypophysis and insulin were administered and a continuous evolution when a thyroid hormone substance was given simultaneously with mercurial diuretics. They give the following explanation: The first two substances increase the power of absorption of the cutaneous tissues in the presence of transudates, while the latter diminish this absorptive power. This explanation is in accord with the current ideas concerning tissue action of the hormones and with the effect of mercurial diuretics on water metabolism. They believe that the histamine blister is particularly adapted to the study of the inhibitory power of such substances on the tissues.

Treatment of Gastroduodenal Ulcer with Injections of Sodium Benzoate.—Liberti treated fourteen patients who had gastric and duodenal ulcers with daily intravenous injections of 2 cc. of a 25 per cent solution of sodium benzoate. The patients were not placed on a strict diet but were advised against drinking alcoholic beverages, smoking and eating acid foods and condiments. The injections were given for from twenty to forty consecutive days, depending on the resistance of the disease to treatment. Two patients showed complete cure after thirty injections, while eleven had a temporary clinical and roentgenologic improvement with eventual recurrences of the disease symptoms within from two to six months. One patient evinced no improvement after the maximum number of injections. The author does not attribute any specific curative power to the sodium benzoate but considers it an effective and useful adjuvant to the medical treatment of gastric and duodenal ulcer.

Archivos de Cardiología y Hematología, Madrid

15: 291-338 (Aug.) 1934

Biologic Standardization of Digitalis Preparations. T. Alday Redonnet.—p. 291.
*Variations of Arterial Blood Pressure in Relation to Changes of Intrapulmonary Atmospheric Pressure. J. A. Adrio Mateo.—p. 316.

Blood Pressure and the Intrapulmonary Atmospheric Pressure.—Adrio Mateo concludes that the arterial blood pressure in normal persons diminishes when the ambient barometric pressure increases and rises when the ambient barometric pressure diminishes. Persons suffering from vasomotor disturbances of nervous instability and those with vasomotor neurosis react to the barometric changes by showing variations of the arterial blood pressure similar to those shown by patients suffering from arteriosclerosis or circulatory diseases. The reaction in these patients, however, is not of a clear type. The arterial pressure in patients with arteriosclerosis, either of the decompensated or of the slightly compensated type, as well as that of those suffering from a circulatory miopragia, descends to normal figures when the ambient barometric pressure increases, just as in normal persons and in those having compensated arteriosclerosis, but descends abnormally when the barometric pressure diminishes. The lowering of the arterial blood pressure in the last mentioned case may be considered a cardiac failure rather than a reaction. It is, in fact, a cardiac claudication. The results of the author's observations explain the frequent appearance of decompensatory and vasomotor disturbances and the general feeling of illness in arteriosclerotic patients under sudden changes of atmospheric pressure. They also show the importance of meteorological pathology as a science in which the clinician and the meteorologist, working together, will enlighten the mechanism of action of the atmospheric pressure on the arterial blood pressure as well as many other facts not as yet clearly understood.

Archiv für klinische Chirurgie, Berlin

179: 615-772 (Aug. 20) 1934. Partial Index

*Evaluation of Power of Resistance of Organism in Surgery. F. Schürer-Waldheim.—p. 615.
Clinical Observations on Healing of Subcartilaginous Bony Tears. M. Ernst.—p. 637.
Treatment of Fractures of Thigh in Childhood. H. Widenhorn and A. Faller.—p. 648.
*Anastomosis of Intrahepatic Bile Duct with Stomach or Intestine by Means of Rubber Tube Prosthesis. E. Gohrbandt.—p. 665.
*Diagnosis and Prognosis of Bone Tumors. R. Glauner.—p. 672.
Tumors of Small Bones of Hands and Feet. T. von Matolcsy.—p. 708.
Absorption of Cerebrospinal Fluid and Osmotherapy. G. Jorns.—p. 717.

Evaluation of Power of Resistance of Organism in Surgical Practice.—According to Schürer-Waldheim, the power of resistance is dependent to a great extent on the functioning of the reticulo-endothelial system, particularly in combating infectious processes. Numerous errors have crept into the methods of estimation of the functional capacity of the reticulo-endothelial system. Erroneous conclusions were frequently arrived at from the so-called functional storage tests. The author has investigated with the aid of an exact photometric method the applicability in surgical diseases of the test of functional storage capacity of the reticulo-endothelium, in particular the colorimetric method of determining the amounts of congo red in the blood serum, according to the method of Adler and Reimann. His experiments demonstrated that the amount of congo red in the serum does not constitute an index of the functional capacity of the reticulo-endothelial system. He leans to the views of Letterer and of Bennhold that the excretion of the injected congo red takes place with the aid of serum albumins and that little of it is taken up by the reticulo-endothelial cells. A fairly valuable partial functional test is offered by the method of a cytologic study of the contents of a cantharides blister as proposed by Kaufmann. Determination of the natural immune bodies in the blood according to the method of Wright (opsonic index) is another valuable method of estimating the power of resistance. The author describes several minor modifications of the Wright method, which are time saving, and cites clinical examples of the great practical value of determining the bactericidal power of an organism in combating septic processes.

Anastomosis of Intrahepatic Bile Duct with Stomach or Intestine.—Gohrbandt describes two surgical methods for the relief of icterus due to complete occlusion of the entire hepatic duct up to the point of exit from the liver. One method consists of puncturing the liver with a trocar 24 cm. long and 1 cm. wide and introducing a rubber tube. The second method consists of a direct anastomosis of an intrahepatic bile duct with the stomach or duodenum, a rubber tube being utilized as a prosthesis. The finding of a distended bile duct on the surface of the liver is not difficult. The duct is cut across and a rubber tube or an artery forceps is introduced while the bile is still flowing. The lumen of the duct may be stretched, if necessary, with the aid of an artery forceps to twice its size. The rubber tube is secured to the wall of the duct by a fine stitch to prevent slipping out. It is then anastomosed to the stomach or duodenum by the method of an oblique fistula formation. The stomach is preferable because of its motility, but the author warns that it is only the acid-containing stomach that will tolerate bile well. The serosa of the stomach or the intestine is sutured to the serosa of the liver about the point of exit of the rubber tube and its entry into the stomach or duodenum. The author reports one case in which trocar puncture and drainage was practiced and three cases in which he performed a direct anastomosis of an intrahepatic duct with the stomach. In all three cases obstruction was due to a malignant growth. This method makes it possible at least to relieve the patient from the effects of the obstructive icterus.

Diagnosis and Prognosis of Bone Tumors.—Glauner presents a study of seventy-seven cases of bone tumor selected from the material of biopsies and operatively resected specimens received at the pathologic institute of the München-Schwabing Hospital. While this is principally a histologic study, the author utilizes the histories, the roentgenologic studies and a follow up to complete the picture of each case. The study is concerned with the following questions: 1. Is histologic examination a competent criterion of benignity of a bone tumor that clinically and roentgenologically suggests a sarcoma? 2. Can the recently differentiated forms of sarcoma be recognized as definite entities with regard to their diagnosis, prognosis and treatment? The study is concerned also with methods of treatment and results as well as with the influence of trauma and of internal secretions. The material consists of four groups. In the first group there were ten cases of benign bone tumors; the second group had twenty-seven cases of undifferentiated sarcomas—spindle cell, round cell and Ewing sarcomas; in the third group there were twenty-two cases of differentiated chondro-osteomyxosarcomas and their combinations, and in the fourth group eighteen cases of benign processes resembling sarcoma, such as osteitis fibrosa localisata and Paget's osteitis deformans. The author concludes that a histologic study is capable of establishing the benign nature of a tumor. The clinical and roentgenologic information is of secondary importance in arriving at this diagnosis; therefore the importance of a biopsy. The roentgenologic appearance of fibrous osteitis, even if supported by a characteristic clinical history, is not a reliable criterion. The same can be simulated by a breaking down chondroma, osteoma and, even more frequently, by a chondrosarcoma and its metastases. The cavity should be curetted and the obtained material studied histologically. The excochleation suffices as treatment for osteitis fibrosa, as proved by the results in their cases. If the process becomes more extensive or displays a tendency to metastasize, a resection

becomes the method of choice. The true sarcomas yield a high mortality regardless of the method of treatment. The greater number of the few who survived a number of years were intensively irradiated with roentgen rays both before and after the operation. Irradiation was found to produce a fibrotic change in the histologic picture. The diagnosis of Ewing sarcoma can be made with assurance only on histologic examination. The prevailing notion that it grows along the shaft of a long bone is not correct. It is located close to a joint, as are the other sarcomas. Because of the difference in the treatment, an accurate diagnosis is particularly important in this group of tumors. Trauma seldom plays a part in the origin of sarcoma. In localized fibrous osteitis, on the other hand, a corresponding local trauma was shown to have existed in every case. The histologic picture of localized fibrous osteitis in the author's experience coincided with that generally described. Differentiation before puberty from a sarcoma was at times impossible. Typical giant cells, when present, simplify the differentiation. The author did not find a single instance of transformation of a localized fibrous osteitis into a general one, nor were disturbances of internal secretions observed in the localized form. Localized fibrous osteitis is a distinct disease of the young resulting from a trauma. The histologic differentiation of Paget's osteitis from fibrous osteitis of older patients may present considerable difficulties. The macroscopic appearance of the bone is of the greatest importance. The conditions are separate entities, Paget's disease occurring in old persons, mostly in women.

Deutsche medizinische Wochenschrift, Leipzig

60: 1371-1414 (Sept. 14) 1934. Partial Index

Connection of Medicine with National and International Research in Natural Sciences. L. Aschoff.—p. 1371.
Importance of Theoretical Medicine for Public Health and for Medical Practice. E. Abderhalden.—p. 1374.
*Oxygen Insufficiency in Cardiac Muscle as Cause of Angina Pectoris. G. von Bergmann.—p. 1378.
*Syndrome of Narcolepsy. H. Reinwein.—p. 1382.
Does Modern Biologic Knowledge About Eczema Have Practical Significance? G. Stümpke.—p. 1384.
Erroneous Diagnoses in Pains of Bones: Hemophilia, Tuberculosis, Osteitis Fibrosa Localisata Recklinghausen. B. Valentin.—p. 1386.
Treatment of Pernicious Anemia in General Practice. H. Deicher.—p. 1390.

Oxygen Insufficiency as Cause of Angina Pectoris.—Von Bergmann says that the pathogenesis of angina pectoris has been explained on the basis of two theories, the coronary and the aortic. He rejects the aortic theory. In discussing the coronary theory he mentions experiments proving that, while the constriction of other vessels is controlled by the sympathetic, the coronary vessels are controlled by the vagus and that the blood supply of the cardiac muscle is adapted to the functional requirements of the heart. If the heart has to meet greater functional requirements, the coronary vessels become wider and the blood perfusion and oxygen supply increase. The author cites experiments (pressure on the vagus) and clinical manifestations (the gastrocardiac syndrome) proving that a disturbance in the blood and thus in the oxygen supply of the heart muscle can be produced by neuroreflex action. Still more important is the fact that an increase of the blood pressure in the carotid sinus produces by reflex action an increase in the tonus of the cardiac vagus. If this increase becomes severe, as for instance in Pal's vascular crises, a contraction of the coronary vessels occurs, the oxygen supply of the heart becomes deficient and angina pectoris may result. The author points out that he definitely accepted several years ago the theory that ischemia in the cardiac muscle, that is, oxygen deficiency in parts of the heart, is the cause of angina pectoris, and he shows that studies in recent years have furnished the proof of this theory. He cites electrocardiographic studies and he emphasizes that not the coronary spasm with total constriction of a coronary branch is the most important factor in the development of angina pectoris but rather the oxygen deficiency in parts of the cardiac muscle.

Syndrome of Narcolepsy.—Reinwein relates the clinical histories of two patients. In the first patient a symptomatic narcolepsy coexisted with acromegaly. The anamnesis and the development make it appear probable that a trauma, which the patient sustained while boxing, was the cause for the development of the narcolepsy as well as of the acromegaly. Observations on the cerebrospinal fluid and on the sella seem to indicate a hypophyseal tumor. Indications of the existence of a cerebral tumor existed also in the second patient. This one had sustained a concussion of the brain thirty years before the attacks of narcolepsy became manifest, but several years previous to that accident he had lost the formerly normally developed hair of the head and of the pubic region. Both patients had the typical symptoms of narcolepsy: attacks of sleep, attacks of loss of tonus and a disturbance of the nocturnal sleep. As the main reason why these cases were reported, the author mentions disturbances in the heat regulation. There existed considerable discrepancies between the axillary and the rectal temperatures. At times the axillary temperature was much higher than the rectal and at other times the rectal was higher than the axillary. The author points out that, considering the close proximity of the center of sleep and of the center of heat regulation, disturbances in the temperature of patients with narcolepsy are not surprising. The literature reports a case of narcolepsy with hypothermia and also calls attention to the fact that the impairment of the sympathetic functions have not been given sufficient attention in patients with narcolepsy. The author is unable to decide whether the disturbance in the heat regulation of his patients is due to morphologic changes in the brain itself or whether hormone actions of the impaired hypophysis are responsible.

Deutsches Archiv für klinische Medizin, Berlin

176: 567-714 (Aug. 22) 1934. Partial Index

*Symptomatology and Heredity of Hemolytic Jaundice. K. Hansen and E. Klein.—p. 567.
*Mechanism of Development of Protracted Subfebrile Temperatures. I. Gelman.—p. 581.
Influence of Nutrition on Metabolism: Influence of Potassium on Metabolism in Rest and Work. F. Bruman.—p. 589.
Pathologic-Histologic Changes in Therapeutic and Experimental Intoxication with Sodium Salicylate and Its Favorable Modification by Dextrose. H. Madisson.—p. 612.
*Predisposition to Thrombosis in Polycythemia Vera. R. Jürgens and K. Bach.—p. 626.
*Testing of Pulmonary Function by Means of Histamine. A. Heymer and F. Grosse-Brockhoff.—p. 651.
*Dangers of Therapeutic Application of Alpha-Dinitrophenol. A. de Châtel and J. Motika.—p. 700.

Symptomatology and Heredity of Hemolytic Jaundice.—Hansen and Klein show a genealogical table of a family with fifty-four members. Hemolytic jaundice runs through four generations. In addition to twenty-one typical cases of hemolytic jaundice there are seven that show only parts of the classic syndrome. The detection of these atypical forms is important not only for the diagnosis of hemolytic jaundice but also for the heredity. In corroboration of Gänsslen's observations, the authors noted in this family also a great number of developmental disturbances and anomalies, but they are as yet unable to state whether the anomalies are in any way related to hemolytic jaundice. They observed tower-head, abnormally wide root of the nose, deformities of the palate, protruding eyes, divergent position of the eyes, mongolic fold, epicanthus, prognathism, persistence of deciduous teeth in adults, misplacement of permanent teeth and other tooth deformities, Dupuytren's contracture of the fifth finger, ongrown ears, accessory nipples, extensive crural ulcers, hemangiomatosis of the skin and acne vulgaris. The abnormalities of the eyes were persistent pupillary membrane, ectropion of the pigmented layer on the sphincter of the iris, cloudiness of the lens, bilateral cataracts of the anterior pole, tortuous retinal vessels, myopia, astigmatism and red-green color blindness. The persistent pupillary membrane is surprisingly frequent. It is present in nearly all the patients with hemolytic jaundice. The authors are unable to state whether it is a true syntropy of hemolytic jaundice or a peculiarity of this family. The heredity of hemolytic jaundice is dominant.

Protracted Subfebrile Temperatures.—Gelman tries to answer the question whether protracted subfebrile temperatures can be considered as a true fever process. Tests on patients revealed that in protracted subfebrile temperatures the main characteristic of a fever process is lacking; namely, increased heat production. Moreover, the author gained the impression that in some of the patients the increase in temperature is only

regional. He assumes that the disturbance in the thermoregulation of persons with protracted hyperthermias is connected with nervous-vascular disturbances. These disorders develop readily in patients with sympathetic instability. In the disturbances of the thermoregulation that exist in exophthalmic goiter and after acute diseases the same mechanism seems to obtain. Krehl spoke of an atactic condition of the involved organs. It is probable that this ataxia, which involves primarily the nervous-vascular mechanism, is sufficient to disturb the normal blood-heat distribution of the organisms. This development of disturbances of the temperature makes it understandable why there is no increase in the metabolic rate, in the oxidation processes and in the heat production. The disturbance in the temperature is rather the result of abnormal regional distribution and of heat elimination. It is not known how this comes about, but it is probable that insufficiencies of the natural barriers of the organism, such as the blood-cerebrospinal fluid barrier, the vascular endothelial barrier and the intestinal barrier, permit toxic substances to enter the regulatory apparatus of the central nervous system, which ordinarily do not enter it. It is possible also that the nervous regulatory ataxia is due to fatigue of the central apparatus. The part played by the endocrine system in the pathogenesis of protracted hyperthermias becomes easy to understand on consideration of the close connections between the endocrine glands and the sympathetic nervous system. Thus it is not the infectious, inflammatory processes or other localized anatomic changes that cause the protracted hyperthermia but rather a change in the reaction of the patient's organism, particularly in his sympathetic nervous system. In treating protracted subfebrile temperatures, the suggestion of different diagnoses and of numerous treatments should be avoided. A change in the mode of life and methods of physical therapy, such as water cures and galvanization of the cervical portion of the spinal column, may be tried. A sojourn in a sanatorium or in a rural district may be helpful.

Predisposition to Thrombosis in Polycythemia Vera.—Jürgens and Bach observed seven cases of polycythemia vera, of which three presented thrombosis. All the patients with thrombosis showed increase in thrombocytes, shortening of the time of thrombosis (capillarthrombometer) and of the agglutination of the platelets and also increase in fibrinogen and globulin. In the four patients with polycythemia vera who were free from thrombosis, these changes were absent. This indicates that not all patients with polycythemia have a predisposition to thrombosis, but only those whose blood shows certain changes. The authors think that in addition to the increased fibrinogen and globulin content the thrombocytosis plays an important part in the formation of thrombi. They emphasize that the measurement of the thrombosis time, the counting of the thrombocytes and the examination of the plasma proteins are methods that will reveal a predisposition for thrombosis without having to take into account the vascular factor, the detection of which is difficult. This is important for the treatment. Roentgenotherapy of the bones of patients with polycythemia reduces the number of thrombocytes and normalizes the thrombosis time and the plasma protein.

Testing Pulmonary Function by Means of Histamine.—To determine the functional capacity of the lung, Heymer and Grosse-Brockhoff employed a test that was introduced by Klein and Nonnenbruch, who had found that the subcutaneous injection of from 1 to 2 mg. of histamine inhibits the oxygen intake of the lung. The authors report their observations on twenty-one persons. In patients with disturbances of the pulmonary circulation, the subcutaneous injection of 1 mg. of histamine is followed by increase in the oxygen saturation deficit of the arterial blood, reduction of the vital capacity and shortening of the respiratory pause. The degree of all these changes shows clearly a dependence on the severity of the clinical manifestations of the disorder. Persons with pneumothorax show the same behavior. The method is especially suitable for the detection of latent disturbances of the lungs and of the pulmonary circulation and is of great value in determining the advisability of collapse therapy.

Dangers of Application of Alpha-Dinitrophenol.—Observations in two cases convinced de Châtel and Motika that alpha-dinitrophenol is not a harmless drug, for even if given in therapeutic doses it produced symptoms that indicate an impairment of the kidneys and of the myocardium. The cardiac disturbances were demonstrated in electrocardiographic tests on the patients and they were corroborated in experiments on cats. Moreover, dinitrophenol does not always accomplish its aim, for in one of the patients the highest therapeutic doses changed neither the metabolism nor the body weight, and in the other one the weight did not decrease much until the sense of taste had become impaired and the patient had lost her appetite.

Klinische Wochenschrift, Berlin

13: 1265-1296 (Sept. 8) 1934. Partial Index

Animal Experiment as Differential Diagnostic Method in Dermatoses Suspected of Being Pemphigus. E. Urbach and S. Wolfram.—p. 1265.
Remarks on Research on Hormones of Hypophysis. A. Jores.—p. 1269.
Studies on Excretory Action of Saliva. J. K. Mayr.—p. 1270.
Pathophysiology of Fat Metabolism in Diabetes Mellitus. S. Leites, E. Sorkin and A. Agaletzkaja.—p. 1272.
*Clinical Experiences with Modified Takata Reaction. A. Jezler.—p. 1276.
Virilism, Functional Disturbances of Ovaries and Hormone Elimination of Anterior Lobe of Hypophysis. H. O. Neumann.—p. 1278.
*Serodiagnosis of Syphilis by Means of Hemagglutination Reaction of Bachmann. G. Petzelt.—p. 1282.

Modified Takata Reaction.—Jezler's report is based on the necropsy material of the medical clinic in Basel. A tabular report of the clinical tests reveals that glomerular nephritis is the only one of the nonhepatic disorders in which the Takata reaction is positive, but in these cases the diagnosis can be based on other clinical symptoms. Another tabulated report indicates the necropsy diagnoses of 264 cases, 104 of which had given a positive Takata reaction. The hepatic changes found in these 104 cases are presented in another table. This table shows that cirrhosis was present in 70 per cent of the cases, engorged liver in 10 per cent, atrophy of the liver in three cases and fatty liver in six cases. The author points out that von Bergmann has emphasized the rôle of fatty liver in the development of hepatic cirrhosis. In the remaining cases there existed conditions such as cholangeitic abscess, syphilis, carcinoma and tuberculosis, and in two cases the pathologic anatomic changes were insufficient to explain a positive Takata reaction. These results indicate that the Takata reaction cannot be considered a definite indication of cirrhosis of the liver, for a number of other hepatic changes may cause a positive outcome of the test. Moreover, although with the exception of the cases of glomerular nephritis a positive Takata flocculation usually proves the existence of a hepatic impairment, a severe hepatic disorder does not necessarily produce a positive Takata reaction. Even in some cirrhoses, particularly in the hemochromatotic forms, a disturbance of the colloidal equilibrium may be absent. In reply to Pongor, who stated that in patients with pulmonary tuberculosis a positive Takata reaction was indicative of an active process, the author replies that in seventy-one cases of open tuberculosis the reaction was positive in only ten. Eight of these could be subjected to necropsy, and in all of them hepatic changes were present.

Diagnosis of Syphilis by Hemagglutination Reaction.—Petzelt states that Bachmann described the serologic diagnosis of syphilis in the active serum by means of the hemagglutination of sheep corpuscles by specific rabbit immune serum. Bachmann based his test on the following observation: If an otherwise normally titrated hemolytic system is intensified, as in the Wassermann test, by the addition of several drops of concentrated amboceptor, the negative serums usually show in the main experiment a more or less pronounced inhibition of the hemolysis, while all positive serums reveal agglutination of the erythrocytes. However, if for the main test active serum is used without the addition of guinea-pig complement, the positive serum, to be sure, produces again strong agglutination, but the negative serum produces complete hemolysis. According to Bachmann, the hemagglutination reaction can replace the other inactive methods of the Wassermann reaction. The author verified the Bachmann test on 506 serums, following Bachmann's technic in every detail. A comparison of the results of the Bachmann test with the Wassermann and Kahn tests revealed to the author complete conformity of the three tests in 76.87 per cent of the cases. A consideration of the sure cases of syphilis (427 of 506) showed that the hemagglutination reaction was specific in 84.4 per cent of the cases. In the other seventy-nine cases an estimation of the specificity was impossible because clinical data were not given.

Medizinische Klinik, Berlin

30: 1177-1212 (Sept. 7) 1934. Partial Index

Tuberculosis of Skin. C. F. Funk.—p. 1180.
*Tuberculosis and Function of Sex Glands. R. Neurath.—p. 1185.
Acute Anterior Poliomyelitis in Mecklenburg. H. Brüning.—p. 1187.
Treatment of Chronic Arthritides During Childhood. H. Beumer and Hilde Peters.—p. 1188.
*Serotherapy and Prophylactic Vaccination for Scarlet Fever. H. Mommsen.—p. 1189.
Fundamentals of Treatment of Pylorospasm. H. Wilke.—p. 1193.
Duration of Nursing Period. W. Kaupe.—p. 1194.
Vaccine Therapy of Whooping Cough. E. Sauer.—p. 1195.
Cultural Demonstration of Tubercle Bacillus in Lumbar Punctate of Tuberculous Meningitis. F. Passini.—p. 1196.

Tuberculosis and Function of Sex Glands.—Neurath shows curves which prove that, while the mortality from all acute infectious diseases is extremely low during the age of puberty, the mortality from tuberculosis increases greatly during this period and reaches its peak around the second decade of life. If different curves are plotted for the two sexes, it is found that in conformity with the earlier sexual maturation of women the mortality from tuberculosis rises earlier and reaches its peak sooner in women than in men. At the age of 20 the tuberculosis mortality of women is 10 per cent above that of men, at 27 the two curves cut each other, and after that the tuberculosis mortality of men remains slightly above that of women. Girls develop tertiary tuberculosis earlier than boys, and the author considers this a sexual manifestation. He points out further that in nurslings and small children tuberculosis becomes manifest mostly in the form of large inflammatory swellings of the bronchial lymph nodes and in a general tuberculosis or in metastatic foci, in children of school age generally in the form of small localized tuberculous infections of the bronchial lymph nodes with a good tendency to healing, but during the age of puberty true phthisis becomes frequent. These phthises are quite malignant and show only a slight tendency to heal. The fact that in a child, aged 5, who had pubertas praecox, a form of tuberculosis developed that ordinarily develops during the second decade of life, and the fact that castrated animals are less susceptible to tuberculosis, are further indications of a connection between the function of the glands and tuberculosis. On the one hand the susceptibility to tuberculosis is influenced by the sexual status, but on the other hand tuberculosis also influences the sexual sphere. In males atrophy and functional impairment of the gonads and specific tuberculous changes in the testicle and in the epididymis have been noted. In tuberculous females there may be amenorrhea. A contrast between the sexual function and tuberculosis is manifested in the frequently greatly increased libido of patients in the terminal stages of phthisis. Whether the pulmonary process causes this increase in the sexual urge, or whether the increased sexual activity hastens the development of the phthisis, cannot be stated.

Serotherapy and Prophylactic Vaccination for Scarlet Fever.—Mommsen points out that the characteristic of scarlet fever is not the presence of streptococci but rather the formation of streptococcic toxins and their invasion of the blood stream. The toxins are the precursors of the subsequent entrance of streptococci into the blood stream. The aim of the treatment should be to intercept and neutralize the toxins in order to prevent the development of a streptococcic sepsis. The antitoxic serum accomplishes this aim, provided it is given early enough and in sufficient quantities. Only the initial toxic stage is influenced by the serum. The author lists the different scarlet fever serums that are in use in Germany and indicates how much of each type is required in cases of average severity and in severe cases. He points out that the injection of horse serum is not an entirely harmless procedure and should be resorted to only when necessary. He discusses prophylactic vaccination for scarlet fever and states that the problem of active, prophylactic vaccination against scarlet fever has not yet been solved in an ideal manner. He considers this method still in the experimental stage and not yet ripe for general introduction in Germany. Moreover, he thinks that the present epidemiologic conditions require no such measure as prophylactic vaccination. He admits however that, if severe epidemics with a high lethality should develop, the threatened portion of the population should be subjected to prophylactic vaccination.

Münchener medizinische Wochenschrift, Munich

81: 1373-1410 (Sept. 7) 1934. Partial Index

*Comparison of Effect During Pregnancy of Pure Vitamin A and of Foods with High Vitamin Content. E. Vogt.—p. 1373.
Ureteritis and Periureteritis as Cause of Gynecologic Disorders. W. K. Fränkel.—p. 1375.
Is There Causal Connection Between Latent Phlebitis in Lower Extremity and Acute and Chronic Arthritis? C. L. Schmidt.—p. 1378.
Influence of Hydrostatic Pressure and of Function on Thrombosis of Lower Extremity. K. W. Fischer.—p. 1378.
Diagnosis and Therapy of Spontaneous Hypoglycemia. R. Kühn.—p. 1380.
*New Method of Treatment for Uremia. J. S. Schwarzmann.—p. 1381.

Effect of Foods with High Vitamin Content During Pregnancy.—Vogt observed that the administration of artificially produced vitamin A during pregnancy exerts no influence on the course of pregnancy, on the delivery, on the puerperium, on the development of the child or on lactation. However, the increase in the vitamin content of the food, particularly by the addition of cod liver oil, has a noticeable effect, especially on the development of the child and on the lactation capacity of the mother. The author stresses that during the entire period of pregnancy the diet should include an adequate amount of fresh fruits and vegetables. He observed that liver diet is helpful during pregnancy because of its high vitamin content and because it counteracts anemia.

New Treatment for Uremia.—Schwarzmann states that in experiments he observed that the tissue extracts reduce the rest nitrogen in the blood, the quantity of lactic acid and the acidity of the urine, and increase the reduced alkali reserve. From this he concluded that the reduction of dyspnea effected by the tissue extract is due to a reduction in acidosis. This factor induced him to try the tissue extracts in the dyspnea of patients with renal disease and in various forms of uremia. He states that uremic attacks in acute nephrosonephritis (with or without increase in the rest nitrogen), which are manifested by convulsions and loss of consciousness or headaches, nausea and vomiting, or headaches and frequent and deep respiration (Kussmaul's respiration), and finally uremic manifestations in patients with nephrosclerosis are favorably influenced by the injection of a tissue extract prepared from the skin, the pleura and the lungs. To a certain degree this extract is effective also in chronic azotemic uremia when the rest nitrogen is greatly increased. The author stresses that cessation of the attacks cannot have been simply accidental, for in all cases improvement concurred with administration of the tissue extract.

Zentralblatt für Gynäkologie, Leipzig

58: 2161-2224 (Sept. 15) 1934

Large-Cell Solid Carcinomas of Gonads. E. Fauvet.—p. 2162.
Sarcomas of Uterus and of Vagina. E. Klaften and E. Navratil.—p. 2170.
Technic of Perforation and of Cranioclasis of Head of Fetus. B. Ottow. p. 2188.
*Why Is Spinal Anesthesia Especially Dangerous in Cesarean Operation? H. Franken.—p. 2191.
Ileus As Result of Uterine Perforation During Abortion. W. Jelinek. —p. 2197.

Danger of Spinal Anesthesia in Cesarean Operation.—Franken points out that, although spinal anesthesia is the ideal method for gynecologic operations, it involves dangers when it is employed for cesarean sections. An investigation of the causes of the frequent complication and of the comparatively high mortality revealed to the author that there are two important factors: 1. If labor pains exist and the twilight sleep is not adequate, the woman, by her behavior, may force the anesthetic upward to the medulla oblongata. 2. The peculiar circulatory conditions of pregnant women and the action of spinal anesthesia on the circulation combine to constitute a grave danger. The author concludes that spinal anesthesia either should be entirely avoided in cesarean operations or, if it is not completely abandoned in this operation, the following precautions should be taken: 1. If a woman has uterine contractions, strains and is restless, spinal anesthesia should not be resorted to. 2. The dosage should be so low that the anesthesia reaches only to the umbilicus. 3. In cases presenting pathologically increased blood pressure and corresponding circulatory involvement, spinal anesthesia should be avoided, and whenever it is employed prophylactic circulatory measures should be taken.